US011248376B2

(12) **United States Patent**
Lundholm

(10) **Patent No.: US 11,248,376 B2**
(45) **Date of Patent: Feb. 15, 2022**

(54) **WALL SYSTEM**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 264 days.

(21) Appl. No.: **16/759,078**

(22) PCT Filed: **Oct. 26, 2018**

(86) PCT No.: **PCT/SE2018/051098**
§ 371 (c)(1),
(2) Date: **Apr. 24, 2020**

(87) PCT Pub. No.: **WO2019/083438**
PCT Pub. Date: **May 2, 2019**

(65) **Prior Publication Data**

US 2020/0370297 A1 Nov. 26, 2020

(30) **Foreign Application Priority Data**

Oct. 27, 2017 (SE) 1751330-0

(51) **Int. Cl.**
E04C 2/292 (2006.01)
E04C 2/08 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***E04C 2/292*** (2013.01); ***E04C 2/08*** (2013.01); *E04B 1/6141* (2013.01); *E04B 2/721* (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC E04B 1/6141; E04B 1/6158; E04B 1/61; E04B 1/6145; E04B 2/721;
(Continued)

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Primary Examiner — Jessie T Fonseca
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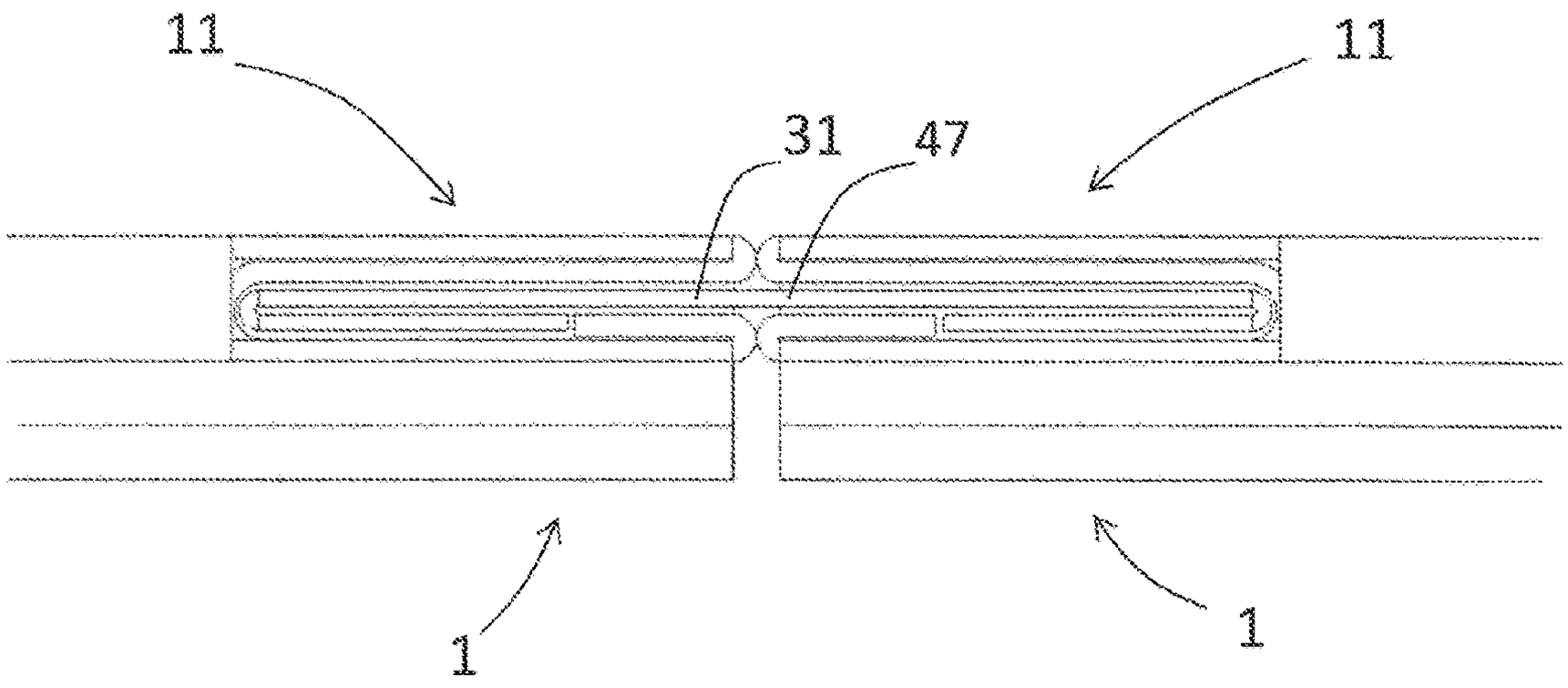
(57) **ABSTRACT**

A wall system comprising at least one wall module and at least one linking element is provided. Said wall module comprising a substantially rectangular plate (**3**), said rectangular plate comprising two side edges (**5***a*, **5***b*), each comprising a side edge bent configuration (**11**), wherein said side edge bent configuration comprises a first side bend (**13***a*), a second side bend (**13***b*) and a third side bend (**13***c*), wherein all three side bends (**13***a,b,c*) are substantially 180° or 160-200° and are provided along different bending lines being parallel with the side edges (**5***a*, **5***b*) of the plate. Said linking element comprises an elongated rectangular plate (**33**; **33'**) comprising two side parts (**45***a*, **45***b*: **45***a'*, **45***b'*) along a length of said plate (**33**; **33'**) and a middle part (**47**; **47'**) along the length of said plate between said two side parts, wherein said two side parts (**45***a*, **45***b*; **45***a'*, **45***b'*) comprises locking features (**43***a*, **43***b*; **201**; **43***a'*, **43***b*; **43***a''*; **43***b''*; **43***a'''*; **43***b'''*), wherein the radius of the second side bend (**13***b*) of the wall module is provided such that a side part (**45***a*, **45***b*; **45***a'*, **45***b'*) of the linking element (**31**; **31'**; **31''**; **31'''**; **31''**) can be provided into an opening (**17**)
(Continued)



between first and third bent side parts (**15***a*, **15***c*) of the wall module and during the connection will be passing a third bent side part (**15***c*) which finally will lock a side part (**45***a*, **45***b*; **45***a'*, **45***b*') of the linking element (**31**; **31'**; **31"**; **31'"**; **31'"**) within the side edge bent configuration (**11**) of the wall module (**1**) when a wall module and a linking element have been connected.

19 Claims, 16 Drawing Sheets

(51) **Int. Cl.**

E04B 1/61	(2006.01)
E04B 2/72	(2006.01)
E04C 2/00	(2006.01)

(52) **U.S. Cl.**
CPC . *E04B 2001/6195* (2013.01); *E04C 2002/004* (2013.01)

(58) **Field of Classification Search**
CPC E04B 2001/6195; E04C 2/292; E04C 2/08; E04C 2/384; E04C 2/38; E04C 2002/004
See application file for complete search history.

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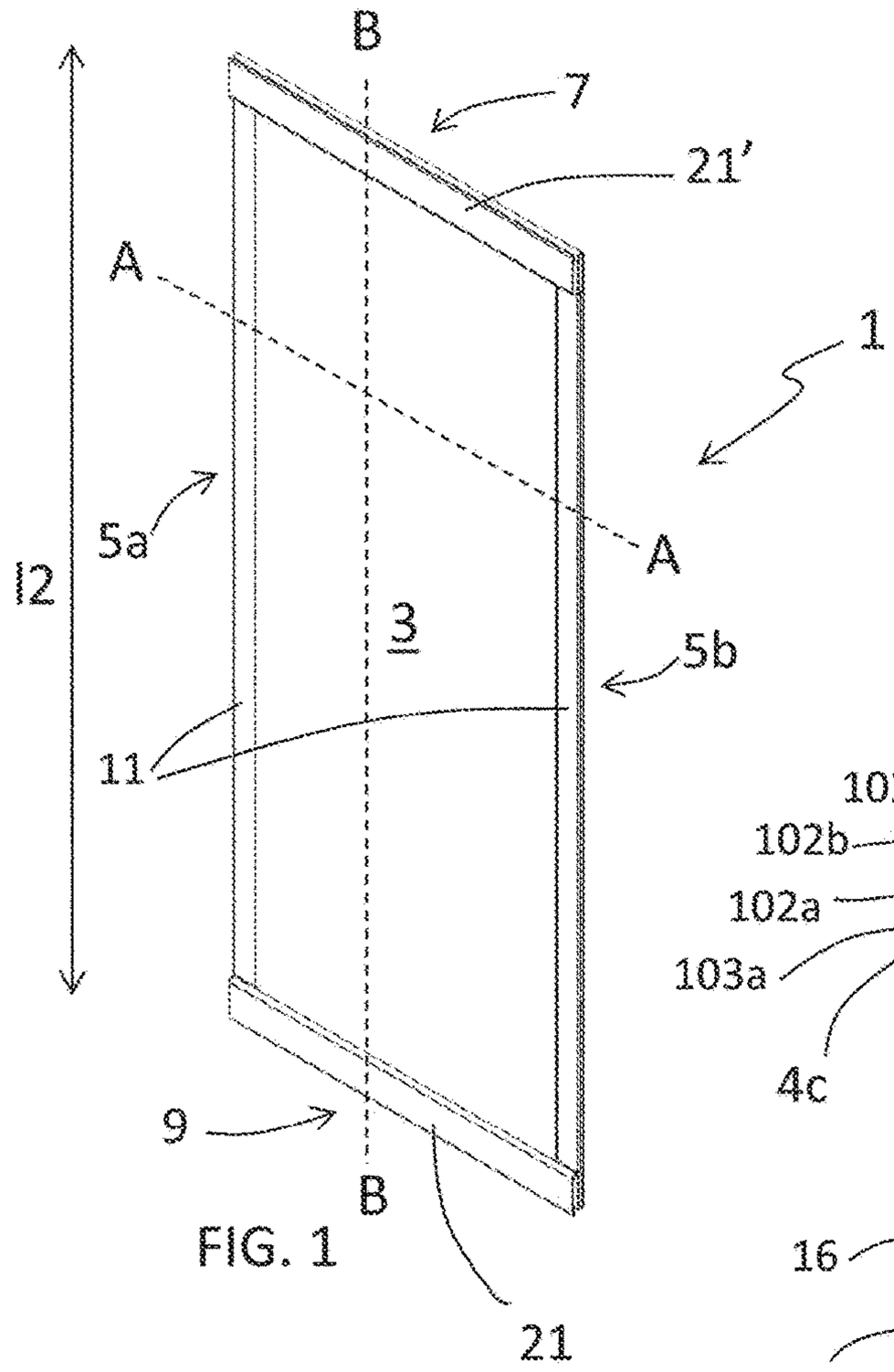
B
7
21'
A
1
5a
A
12
3
5b
11
9
B
21

FIG. 1

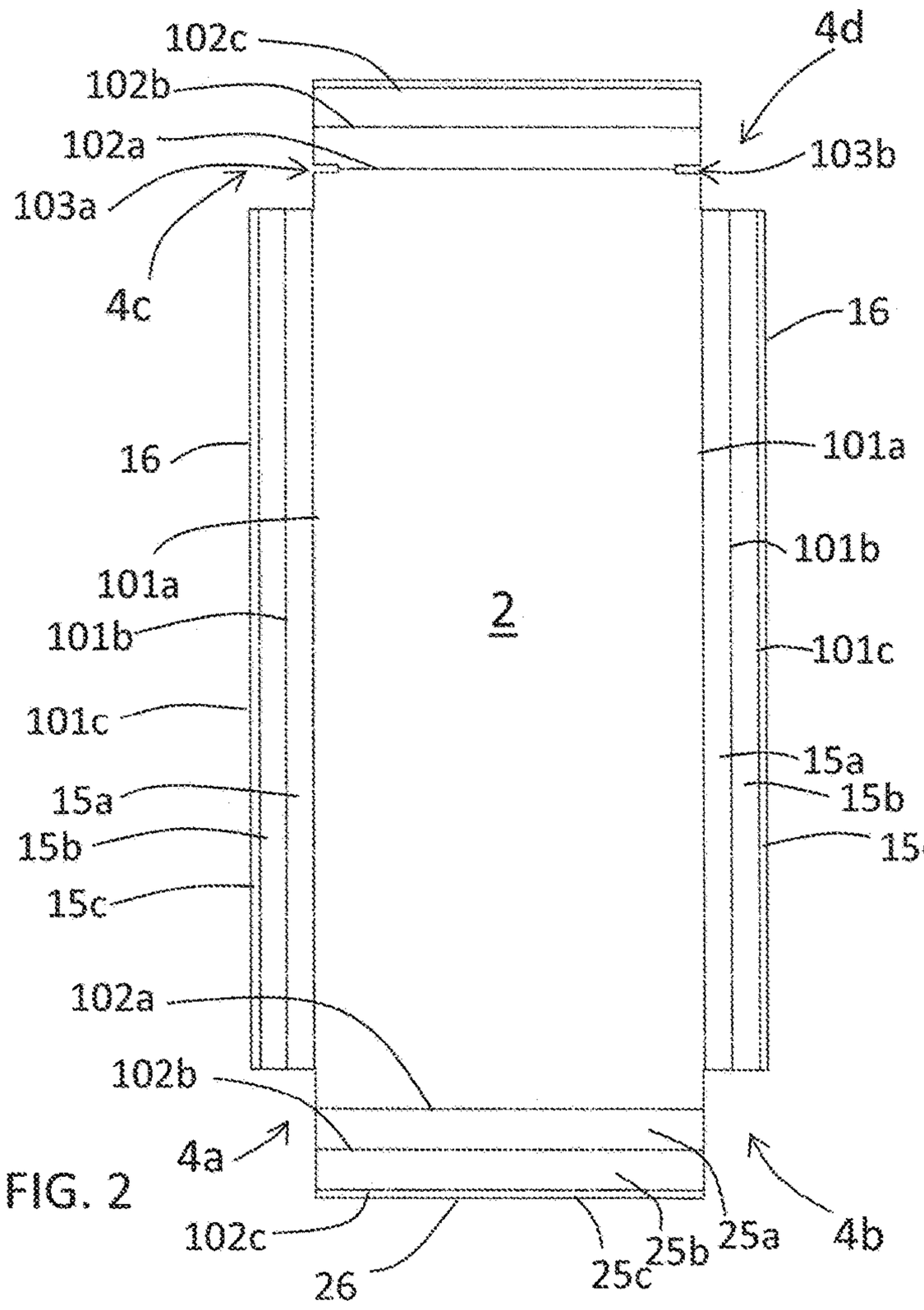
102c
4d
102b
102a
103b
103a
4c
16
16
101a
101a
101b
2
101b
101c
101c
15a
15a
15b
15b
15c
15c
102a
102b
4a
102c
26
25c
25b
25a
4b

FIG. 2

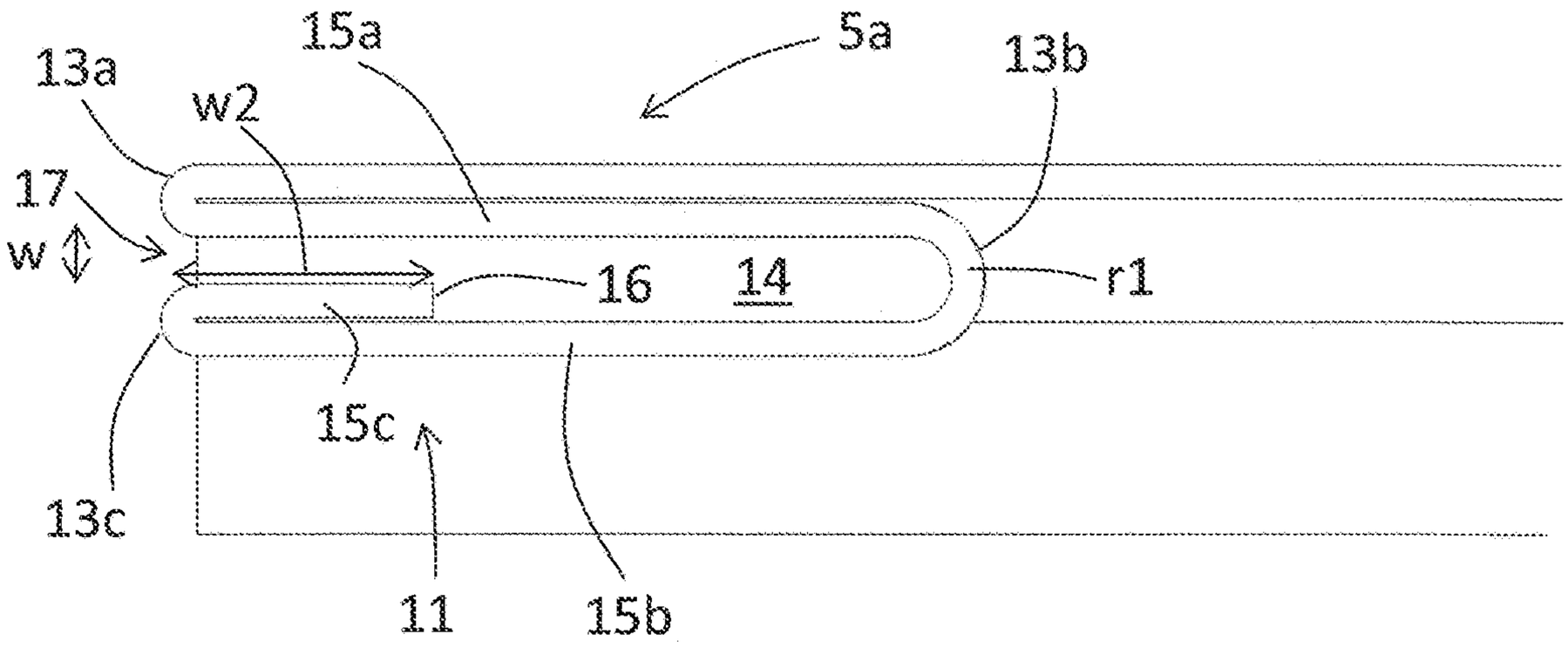
15a
5a
13b
13a
w2
17
w
16
14
r1
15c
13c
11
15b

FIG. 3a

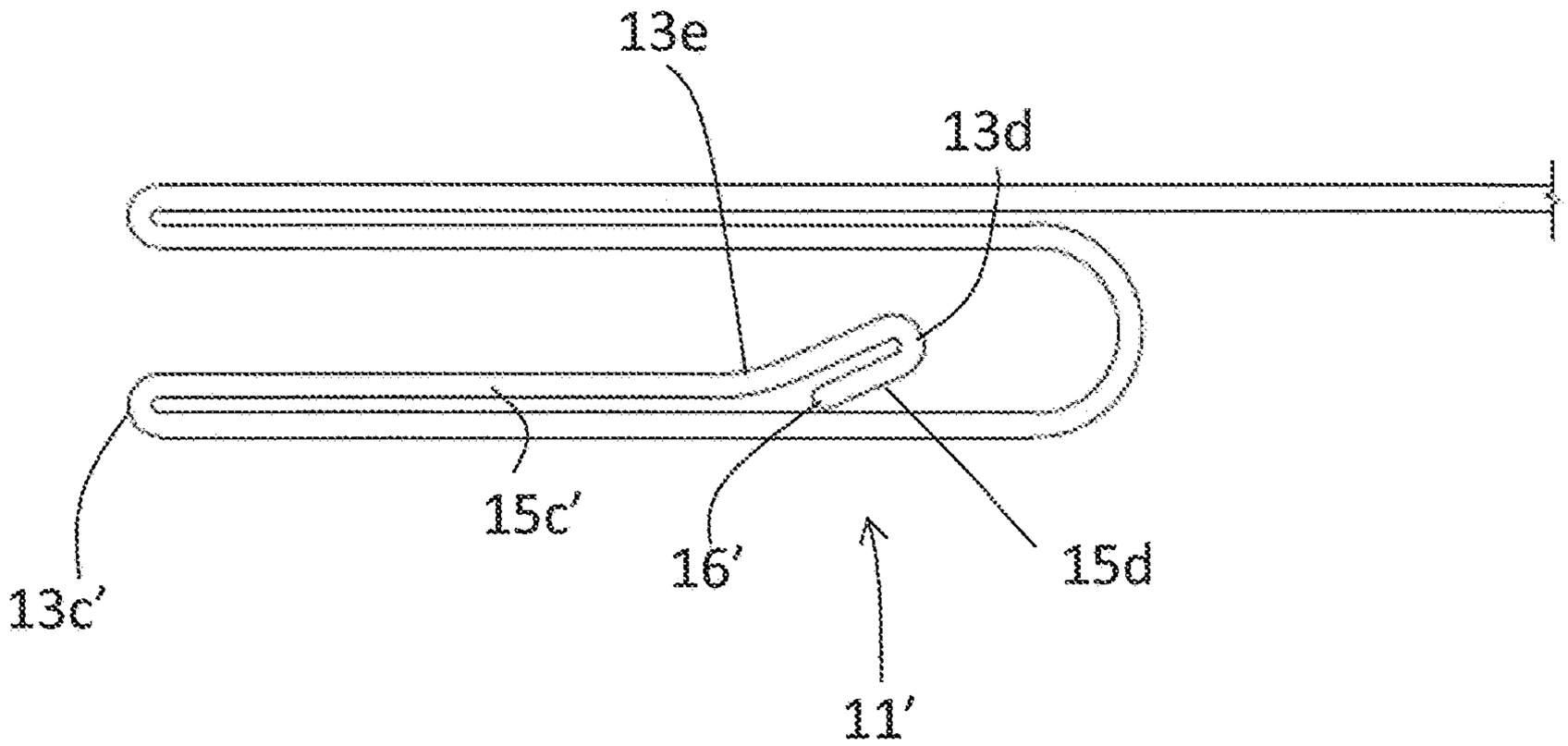
13e
13d
15c'
16'
15d
13c'
11'

FIG. 3b

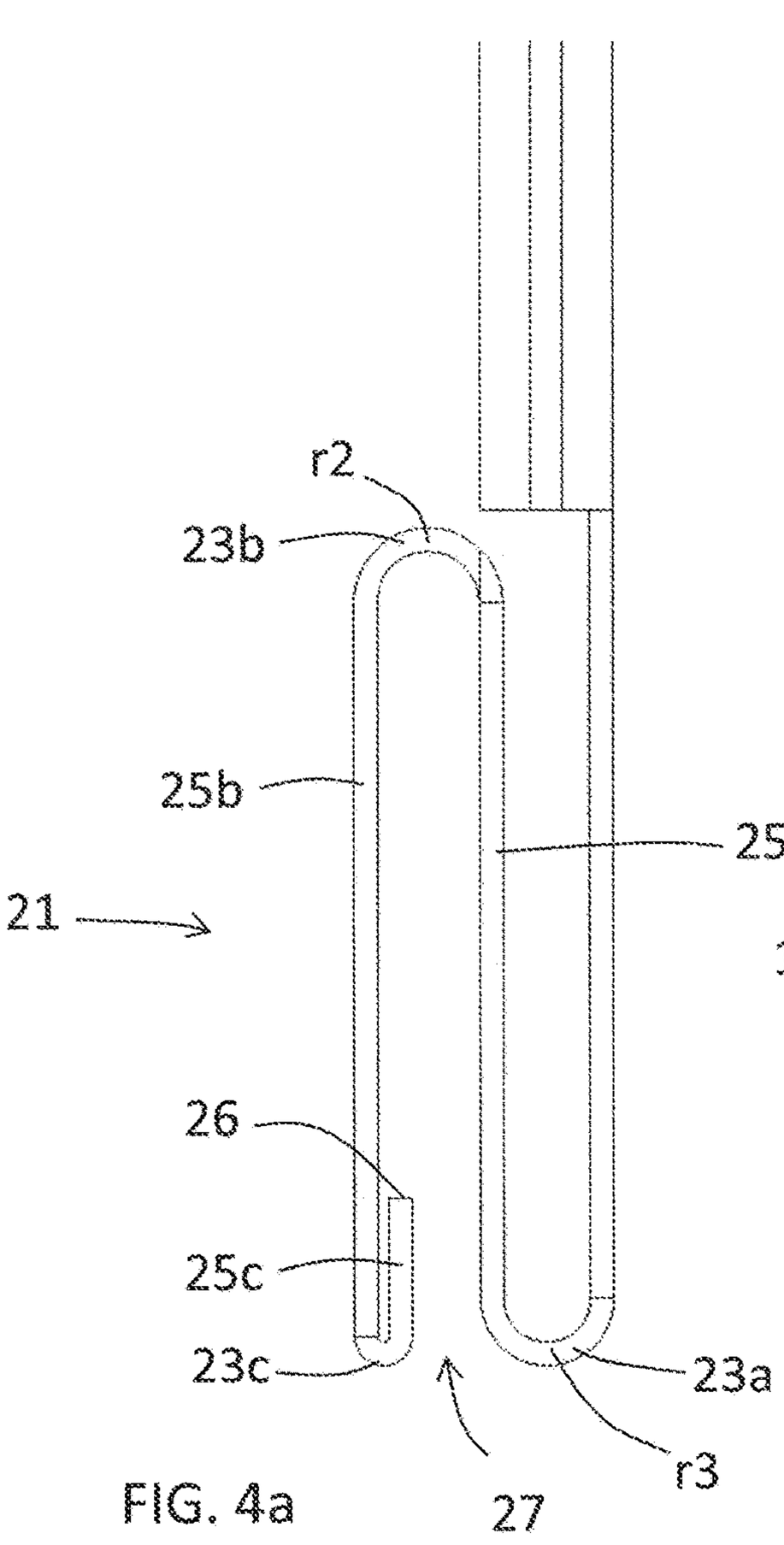
r2
23b
25b
25a
21
26
25c
23c
23a
r3
27

FIG. 4a

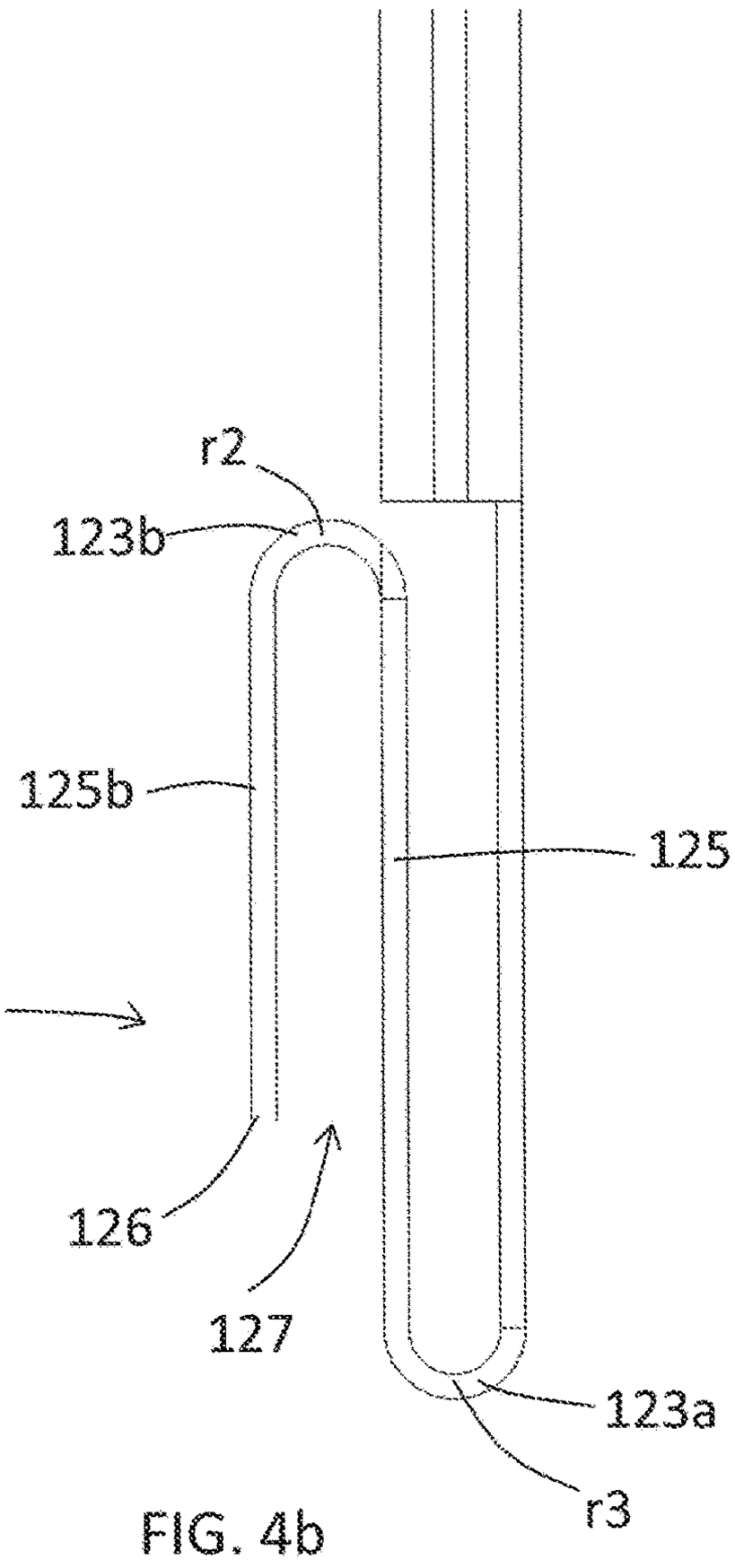
r2
123b
125b
125a
121
126
127
123a
r3

FIG. 4b

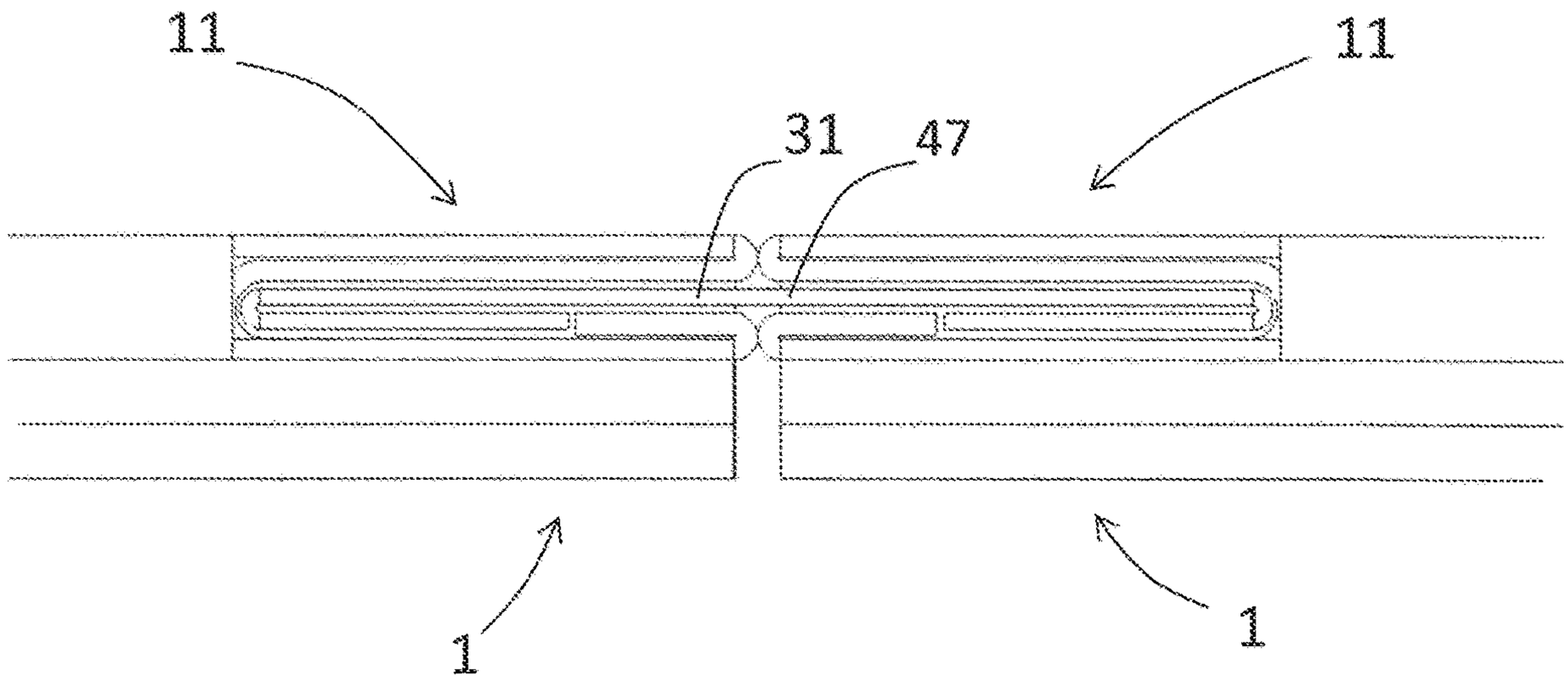

FIG. 5

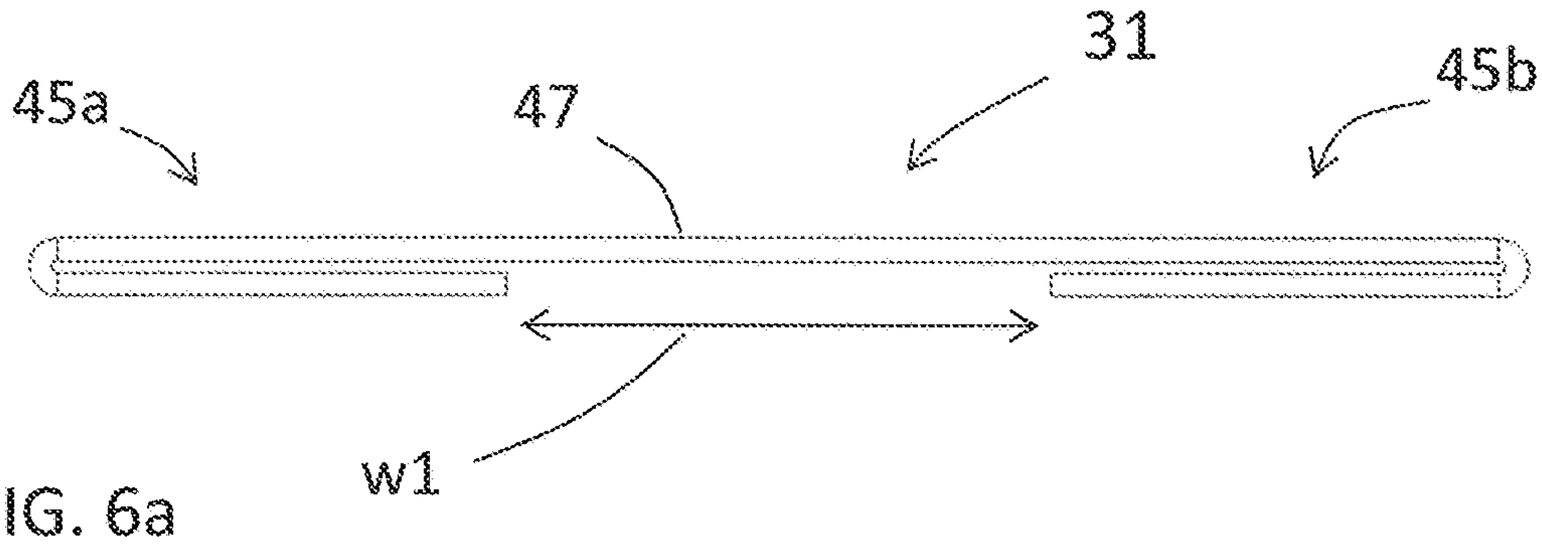

FIG. 6a

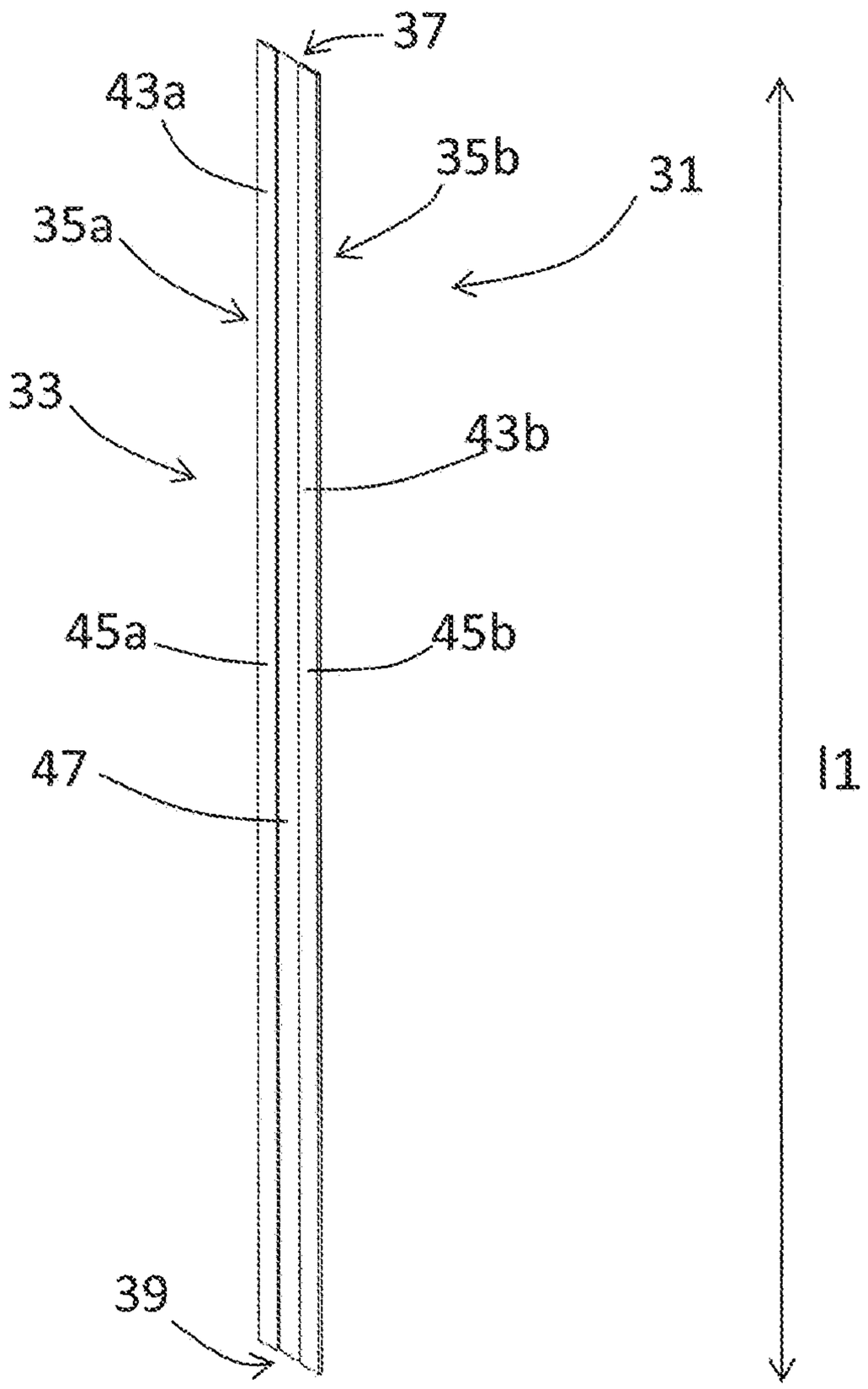

FIG. 6b

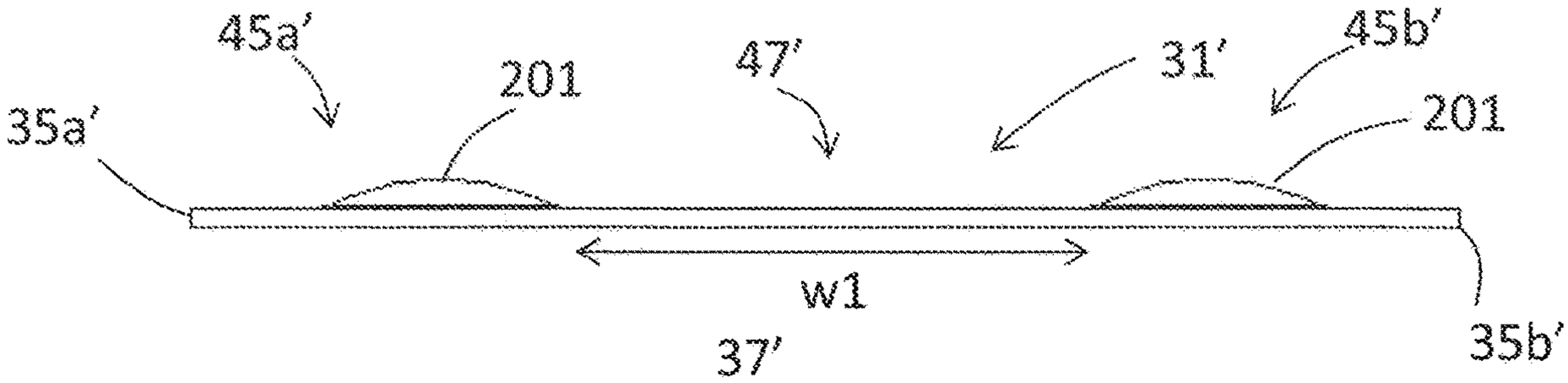

FIG. 6c

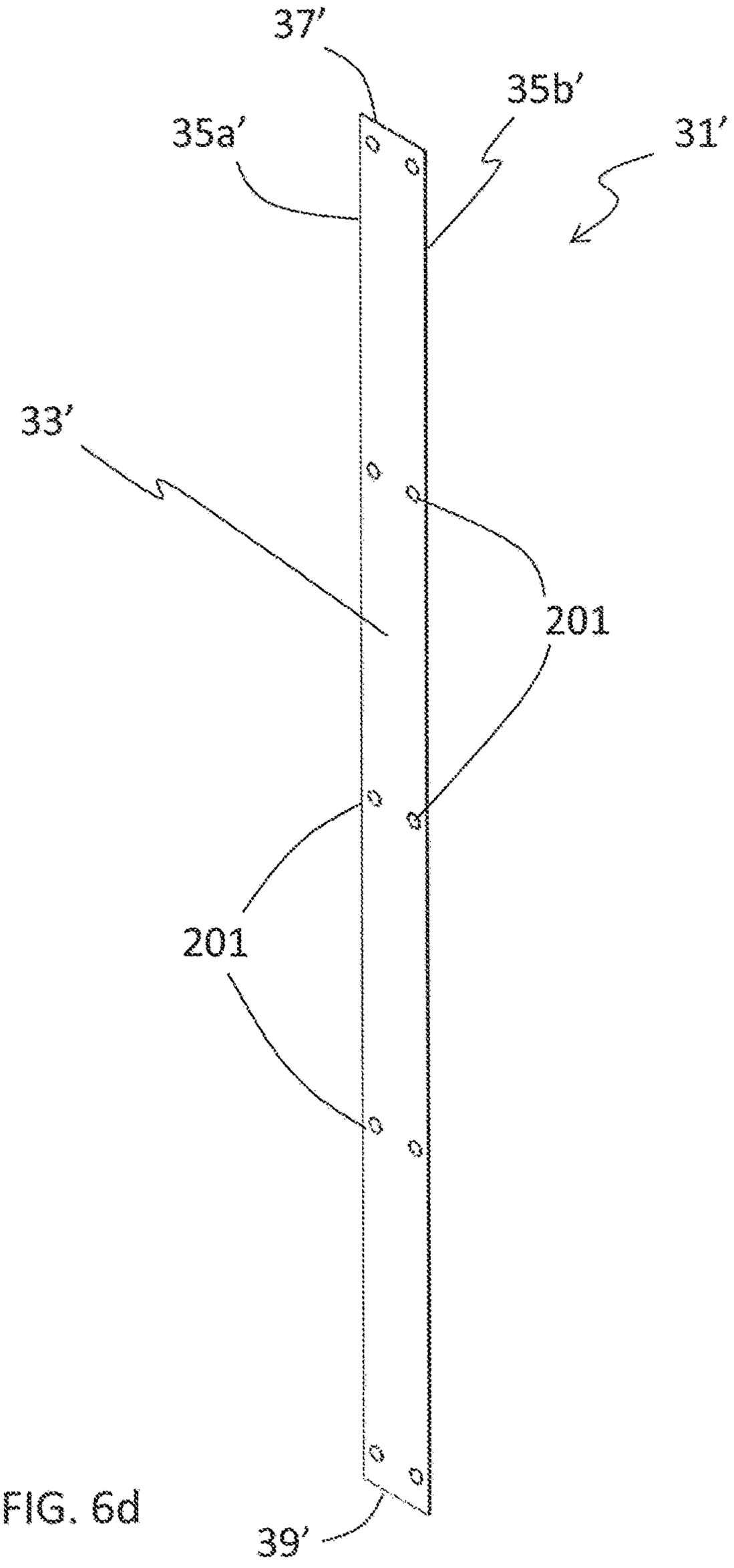

FIG. 6d

FIG. 6e

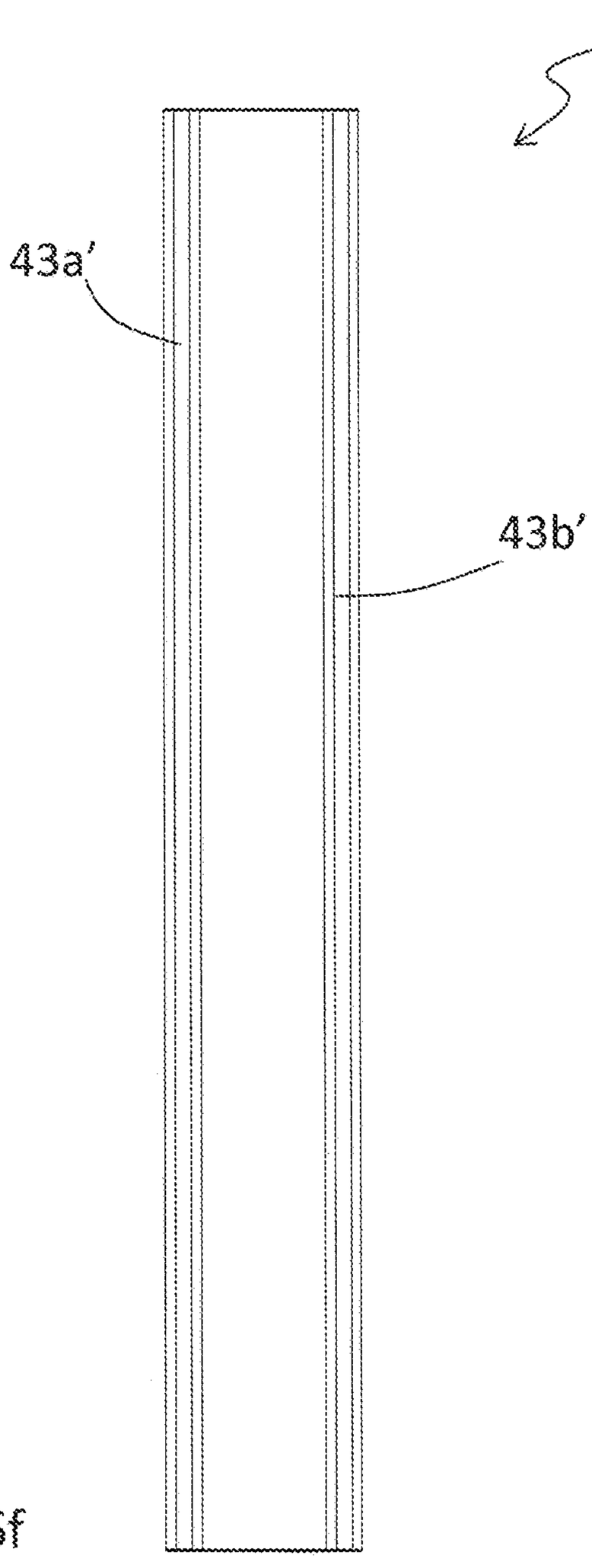

FIG. 6f

FIG. 6g

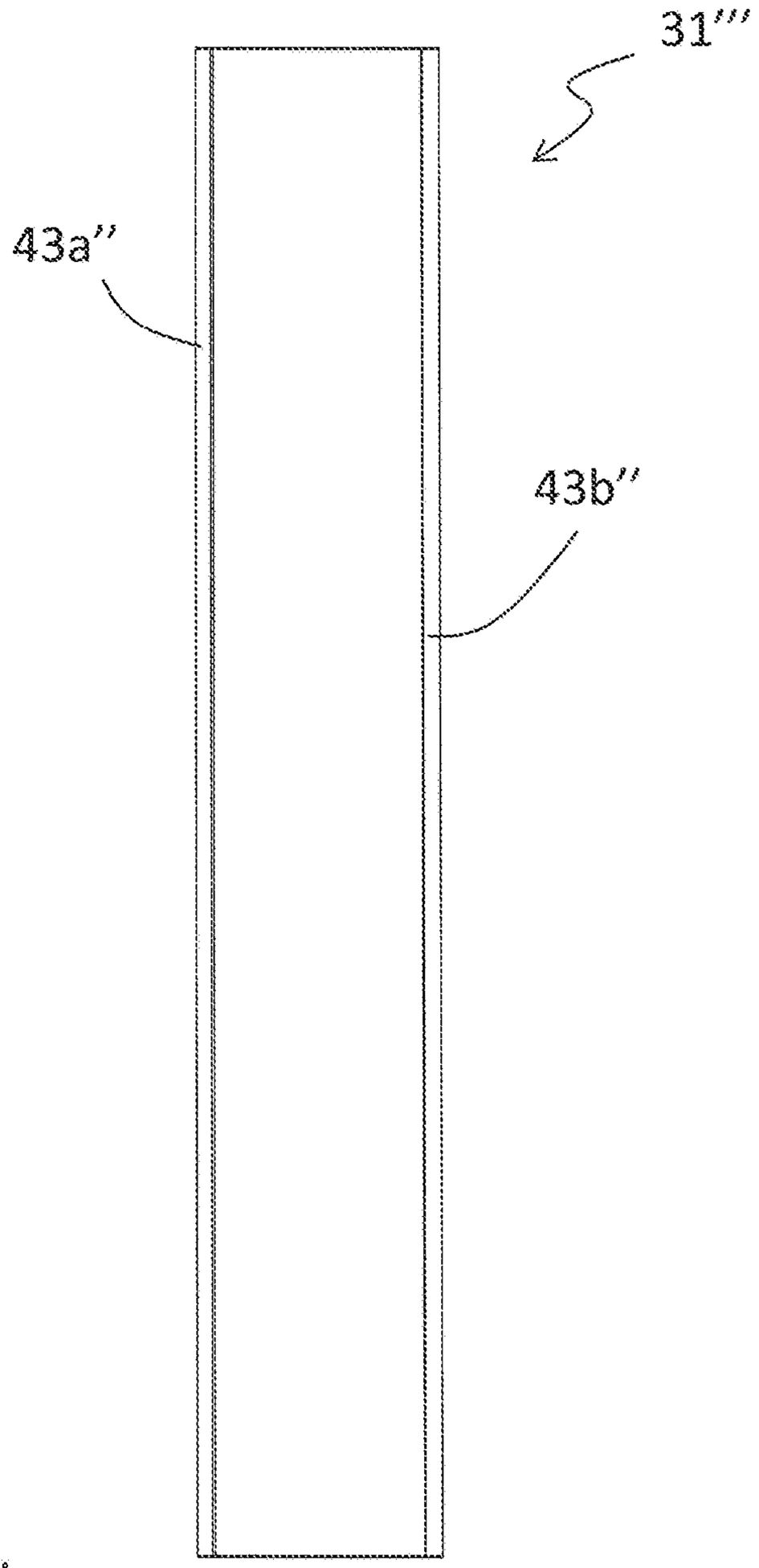

FIG. 6h

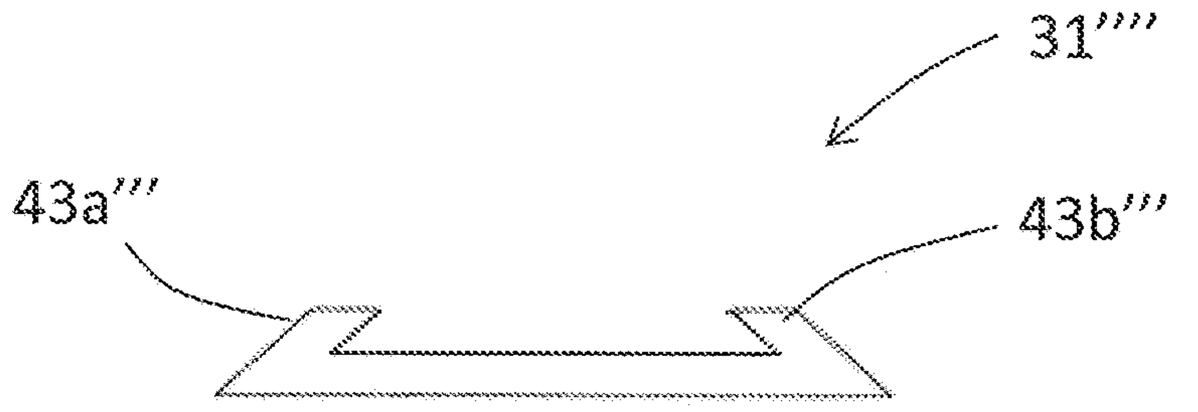

FIG. 6i

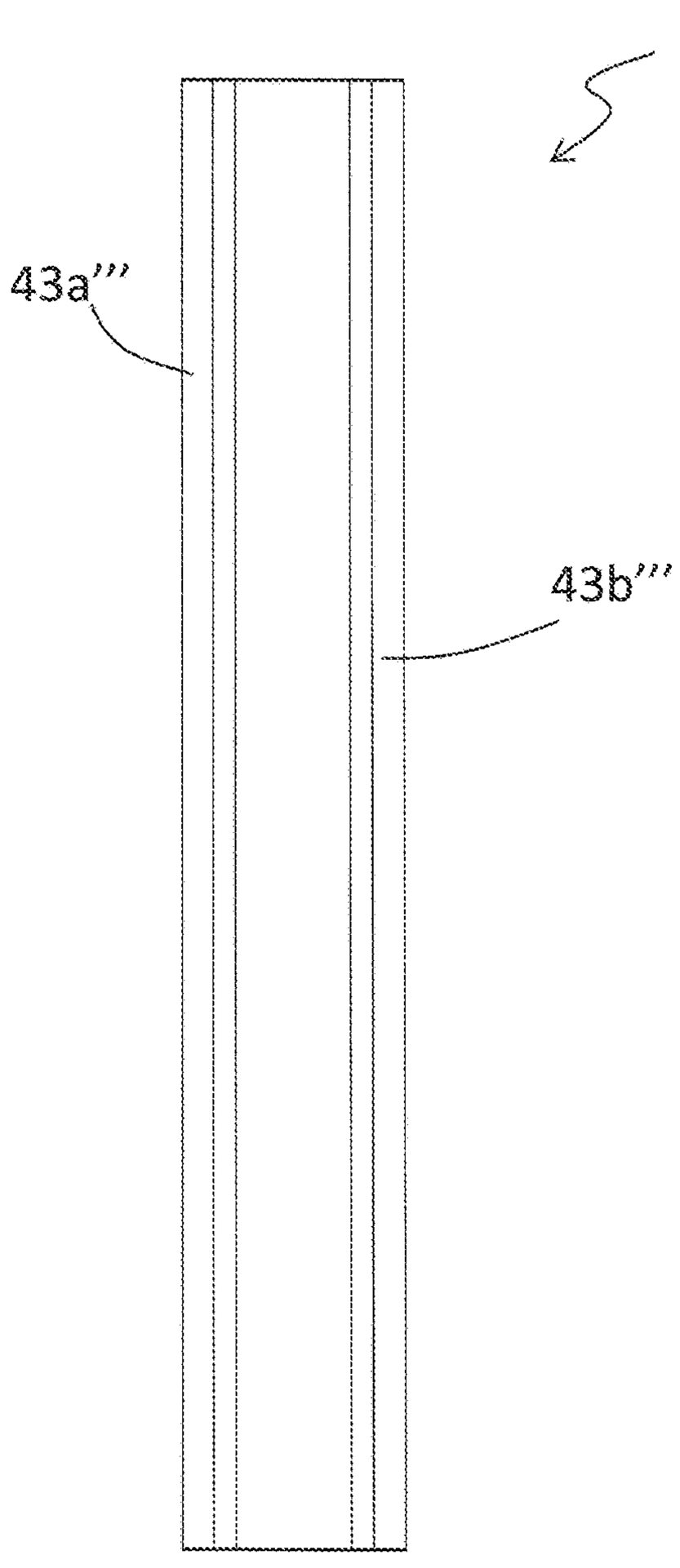

FIG. 6j

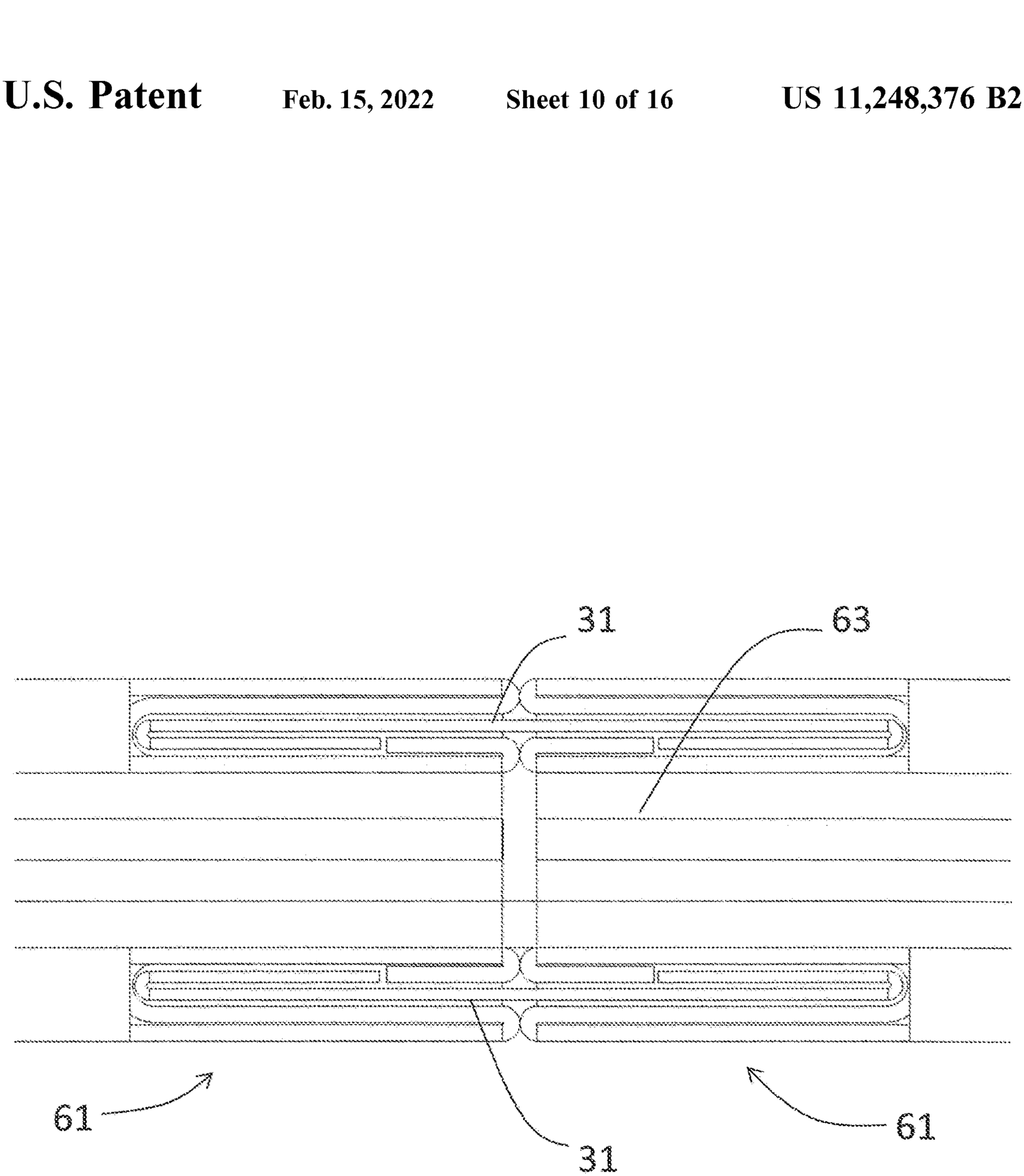

FIG. 7

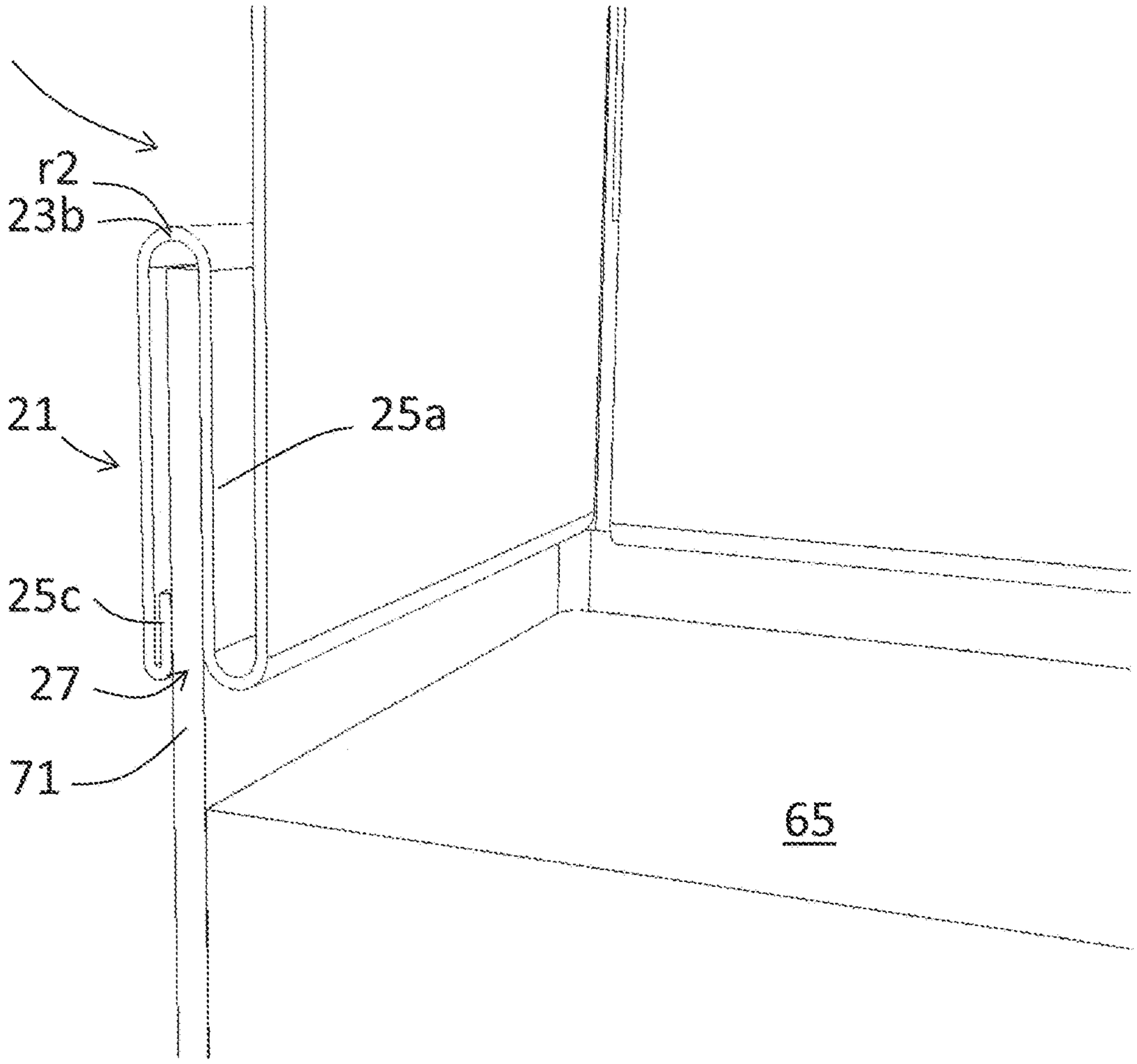

FIG. 8

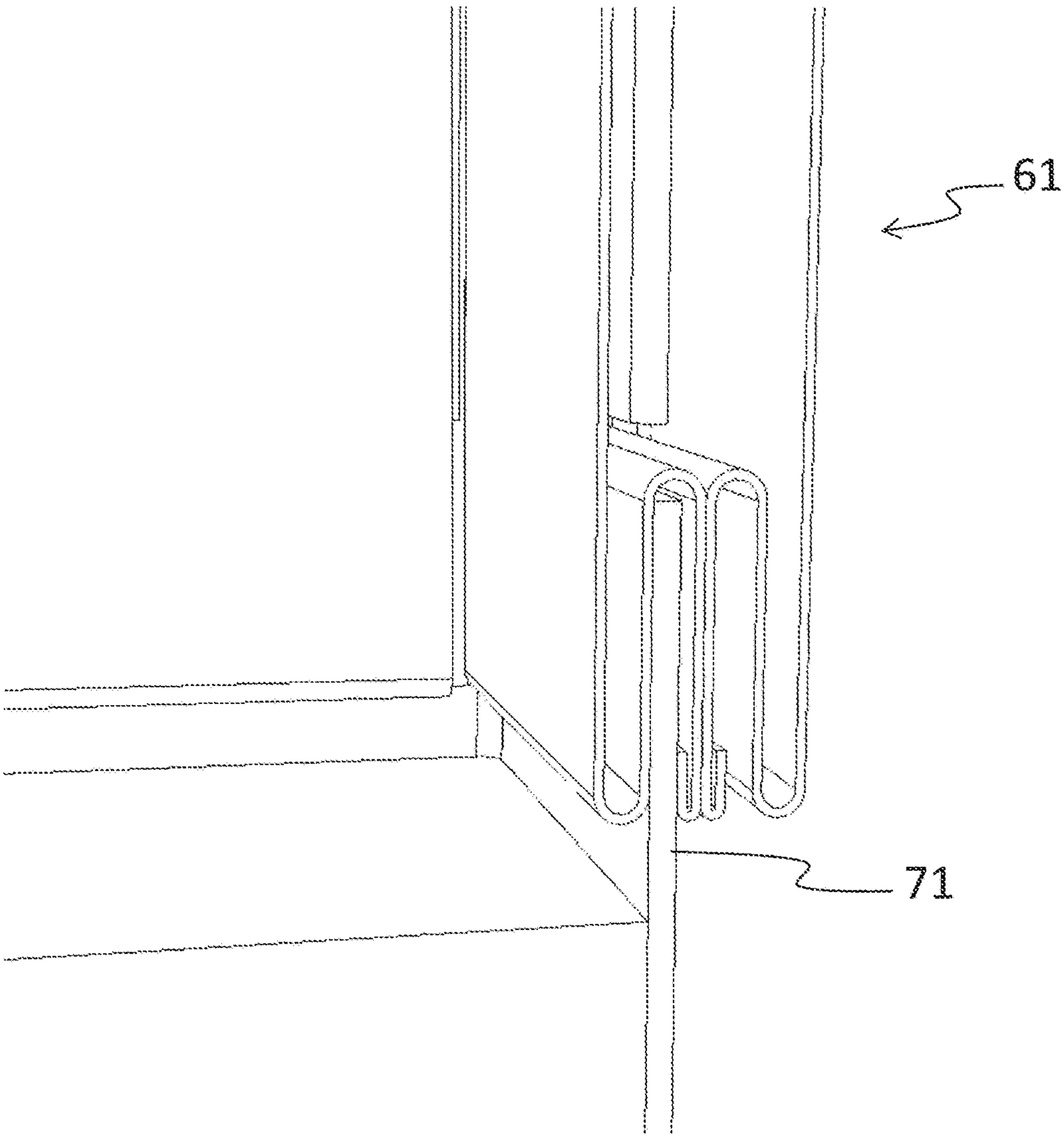

FIG. 9

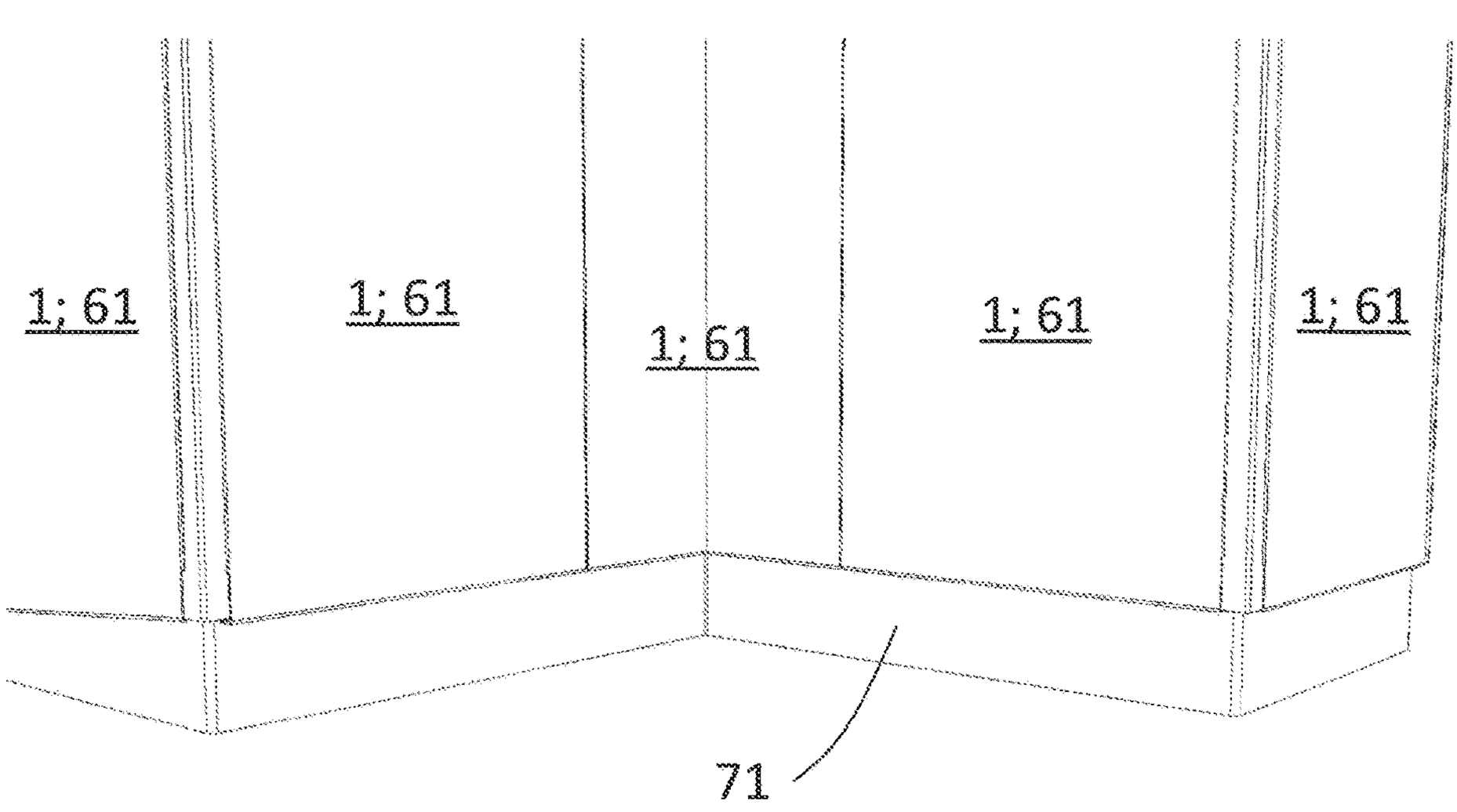

FIG. 10

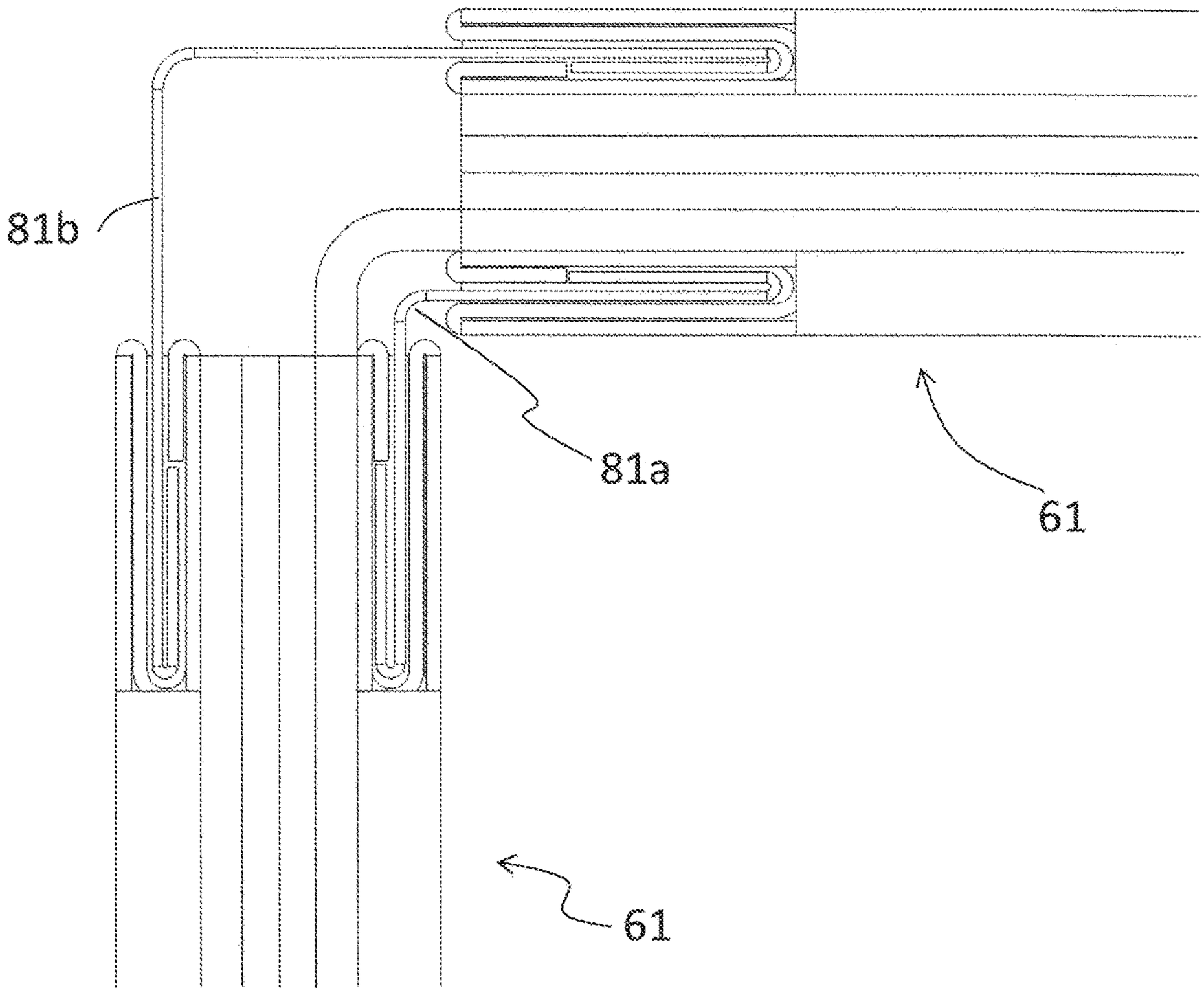

FIG. 11

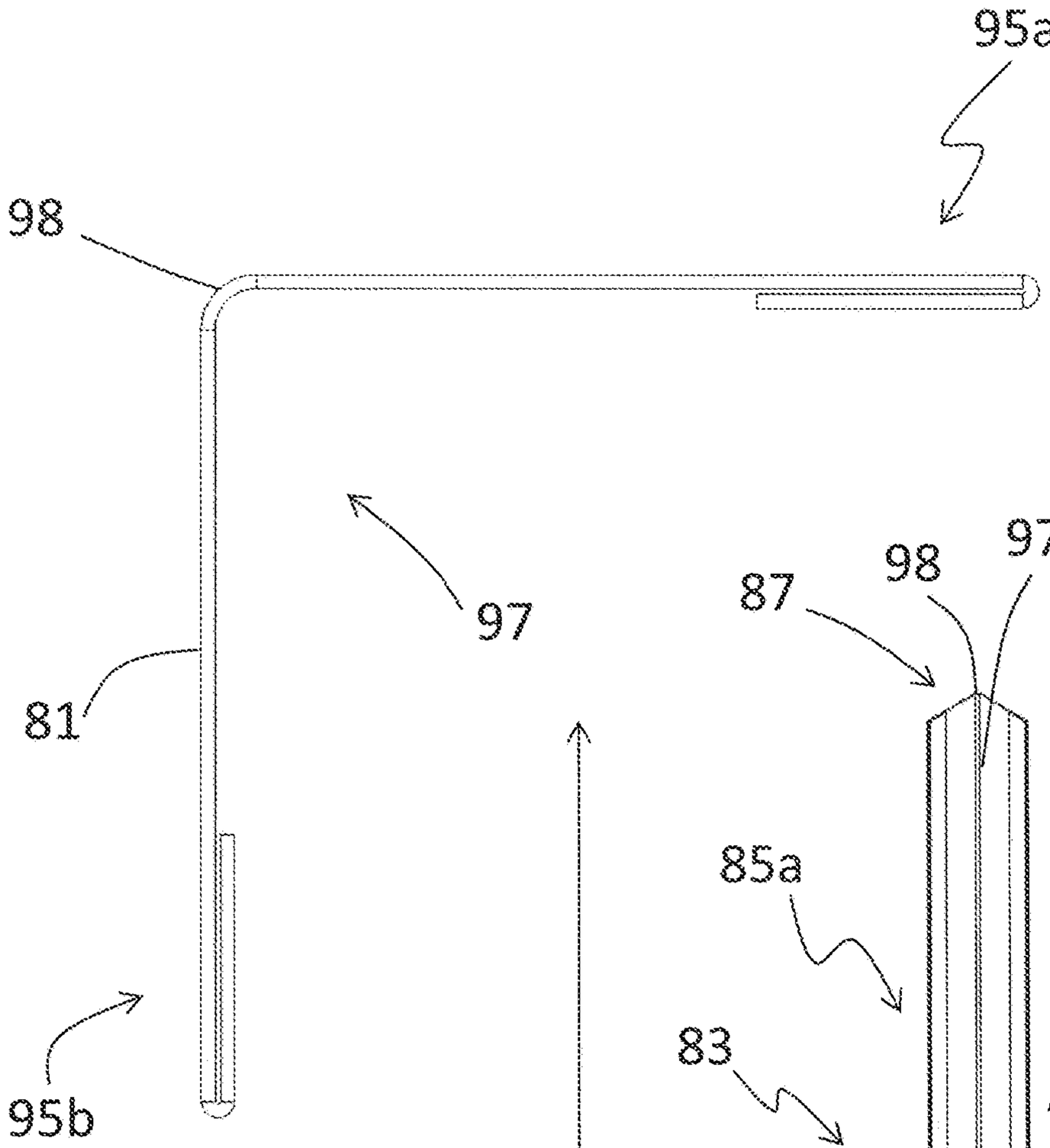

FIG. 12a

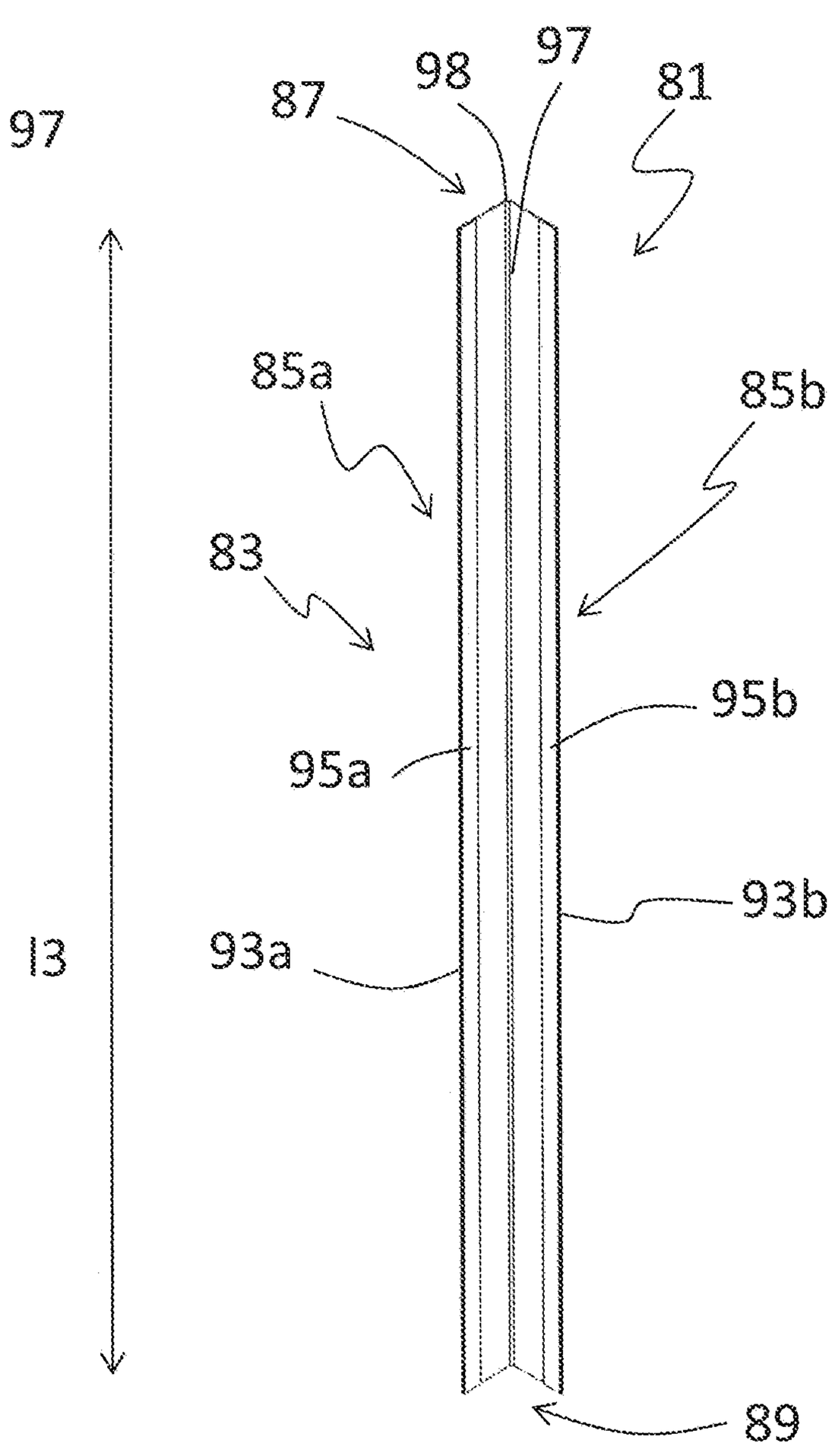

FIG. 12b

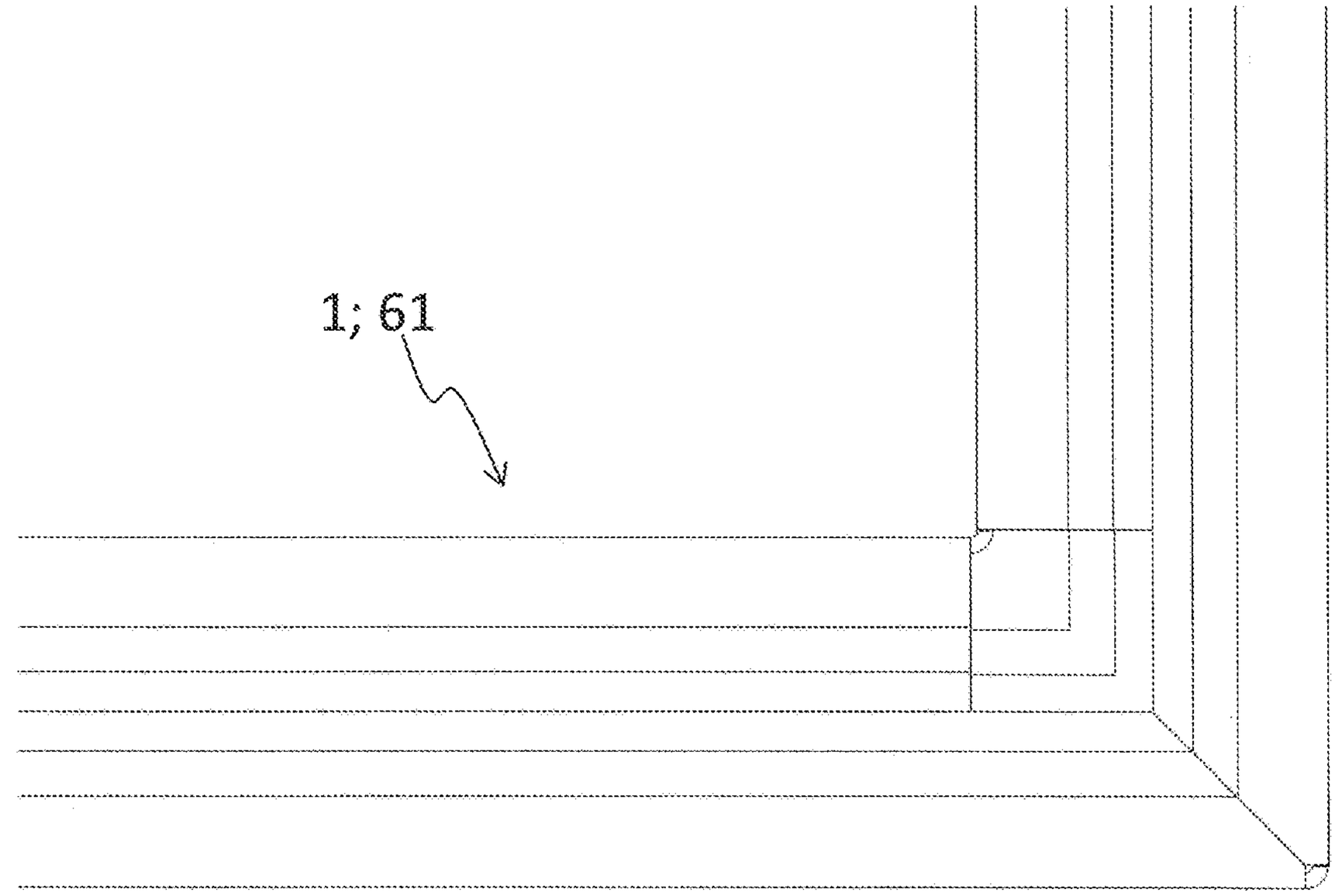

FIG. 13

WALL SYSTEM

TECHNICAL FIELD OF THE INVENTION

The present invention relates to a wall system and a wall segment.

RELATED ART

Wall modules which can be connected to each other and which together make up a larger wall section have been described in for example SE369090. Here a linking element is used to connect the wall modules to each other. Other types of wall modules which are connected to each other without a linking element have also been described. For example in GB599011 one side of each wall module comprises a first interengaging member and the other side comprises a second interengaging member. Said first interengaging member can be engaged with a second interengaging member of another wall module to make up a larger wall segment.

SUMMARY

An object of the invention is to provide an improved wall system with wall modules which can be easily mounted to each other.

This is achieved by a wall system and wall segment according to the description herein.

According to one aspect of the invention a wall system comprising at least one wall module and at least one linking element is provided. Said wall module comprising a substantially rectangular plate. Said rectangular plate comprising two side edges, one top edge and one bottom edge, said side edges each comprising a side edge bent configuration, wherein said side edge bent configuration comprises a first side bend, a second side bend and a third side bend, wherein all three side bends are substantially 180° or 160-200° and are provided along different bending lines being parallel with the side edges of the plate, whereby the side edge bent configuration comprises a first bent side part provided along the side edge of the plate between the first side bend and the second side bend, a second bent side part provided along the side edge of the plate between the second side bend and the third side bend and a third bent side part provided along the side edge of the plate between the third side bend and an open end side or possibly a fourth bent side part of the plate, wherein said first bent side part will be provided between the plate and said second bent side part and wherein said third bent side part is provided in between said first and said second bent side parts and which third bent side part is smaller than both the first and the second bent side parts. Said linking element comprises an elongated rectangular plate (**33**; **33'**) comprising two side parts (**45***a*, **45***b*: **45***a'*, **45***b'*) along a length of said plate (**33**; **33'**) and a middle part (**47**; **47'**) along the length of said plate between said two side parts, wherein said two side parts (**45***a*, **45***b*; **45***a'*, **45***b'*) comprises locking features (**43***a*, **43***b*; **201**), wherein the radius of the second side bend (**13***b*) of the wall module is provided such that a side part (**45***a*, **45***b*; **45***a'*, **45***b'*) of the linking element (**31**; **31'**) can be provided into an opening (**17**) between the first and third bent side parts (**15***a*, **15***c*) of the wall module and during the connection will be passing the third bent side part (**15***c*) which finally will lock a side part (**45***a*, **45***b*; **45***a'*, **45***b'*) of the linking element (**31**; **31'**) within the side edge bent configuration (**11**) of the wall module (**1**) when a wall module and a linking element have been connected.

According to another aspect of the invention a wall segment is provided comprising a wall system as defined above comprising at least two wall modules connected by at least one linking element.

Hereby a wall system is provided comprising a wall module which can be built from a rectangular plate by just bending the side edges of the plate. The side edges of the plate are bent three times each for providing a side edge bent configuration with an opening along its side edges for receiving a linking element when two wall modules are connected. This provides for an easily built wall module with connection capabilities. The locking features of the linking element and its cooperation with the third bent side part in the side edge bent configuration of the wall module provides for a stable wall construction.

In one embodiment of the invention a radius of the second side bend is provided such that an opening into the side edge bent configuration is provided between the first and third bent side parts for receiving a linking element.

A further object of the invention is to provide a wall system with wall modules which can be easily mounted to a floor strip.

This is achieved by a wall module, wherein said bottom edge of said rectangular plate comprises a bottom edge bent configuration, wherein said bottom edge bent configuration comprises a first bottom bend and a second bottom bend, wherein the first and second bottom bends are substantially 180° and are provided along different bending lines being parallel with the bottom edge of the plate, whereby the bottom edge bent configuration comprises a first bent bottom part provided along the bottom edge of the plate between the first bottom bend and the second bottom bend, a second bent bottom part provided along the bottom edge of the plate between the second bottom bend and either a third bottom bend or an open bottom end side of the panel, wherein the first bent bottom part will be provided between the plate and the second bent bottom part.

Hereby a wall module is provided which also has a bottom edge bent configuration along its bottom edge and the wall module can be provided mounted to a floor strip. Hereby an easy mounting of the wall module to a floor is achieved and furthermore a water proof mounting can easily be assured.

In one embodiment of the invention a radius of the second bottom bend is provided such that an opening into the bottom edge bent configuration is provided between the first and second bent bottom parts for receiving a floor strip.

In one embodiment of the invention said bottom edge bent configuration comprises also a third bottom bend being substantially 180° and being provided along a bending line which is parallel with the bottom edge of the plate and hereby said bottom edge bent configuration further comprises a third bent bottom part provided along the bottom edge of the plate between the third bottom bend and an open bottom end side of the panel, which third bent bottom part being provided in between said first and said second bent bottom parts and which third bent bottom part is smaller than both the first and the second bent bottom parts.

In one embodiment of the invention a radius of the first bottom bend is provided such that the first, second and third bend side parts of the side edges are provided in between a plane in which the first bent bottom part is provided and a plane in which a center part of the plate is provided. Hereby a linking element which will link two wall modules to each other will always be provided inside a floor strip when the

wall modules also are mounted to such a floor strip. If the linking element is provided along the whole length of the wall module and hereby also down to the floor inside the floor strip water cannot pass outside. Hereby a water proof mounting is achieved.

In one embodiment of the invention a width of the middle part of the linking element corresponds substantially to a width of the third bent side part of the wall module times two.

In one embodiment of the invention said locking features extend from a plane of the elongated rectangular plate of the linking element, which locking features will be locked inside the side edge bent configuration by the third bent side part when a wall module and a linking element have been connected.

In one embodiment of the invention a length of said linking element corresponds substantially to a length of the wall module.

In one embodiment of the invention said locking features are double folds of the plate along its side edges hereby providing two side parts of the linking element comprising double folded plate and a middle part of the linking element comprising a single layer of the plate.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a wall module according to one embodiment of the invention.

FIG. **2** shows a blank of a wall module according to one embodiment of the invention before edges of the wall module have been bent.

FIG. **3***a* is a cross section along line A:A in FIG. **1** of the wall module showing a side edge bent configuration of one of the sides edges.

FIG. **3***b* is a cross section of a side edge bent configuration of a wall module according to another embodiment of the invention.

FIG. **4***a* is a cross section along line B:B in FIG. **1** showing a bottom edge bent configuration of a bottom part of a wall module according to one embodiment of the invention.

FIG. **4***b* is a cross section showing a bottom edge bent configuration of a bottom part of a wall module according to another embodiment of the invention.

FIG. **5** is a cross section top view of two connected wall modules according to one embodiment of the invention.

FIGS. **6***a* and **6***b* show a linking element according to one embodiment of the invention.

FIGS. **6***c* and **6***d* show a linking element according to another embodiment of the invention.

FIGS. **6***e* and **6***f* show a linking element according to another embodiment of the invention.

FIGS. **6***g* and **6***h* show a linking element according to another embodiment of the invention.

FIGS. **6***i* and **6***j* show a linking element according to another embodiment of the invention.

FIG. **7** is a cross section top view of two connected wall modules of sandwich type according to one embodiment of the invention.

FIG. **8** is a cross section side view of a wall module according to one embodiment of the invention when the wall module is connected to a floor strip.

FIG. **9** is a cross section side view of a wall module of sandwich type according to one embodiment of the invention when the wall module is connected to a floor strip.

FIG. **10** shows five wall modules according to different embodiments of the invention connected to each other and to a floor strip.

FIG. **11** is a cross section top view of two wall modules according to one embodiment of the invention connected to each other by a corner linking element according to one embodiment of the invention.

FIGS. **12***a* and **12***b* show schematically a corner linking element according to one embodiment of the invention.

FIG. **13** shows an alternative corner of a wall module.

DETAILED DESCRIPTION OF EMBODIMENTS

FIG. **1** is a perspective view of a wall module **1** according to one embodiment of the invention. FIG. **2** shows a blank **2** of the wall module **1** shown in FIG. **1** before edges of the wall module **1** have been bent. Side edge bending lines **101***a*, **101***b*, **101***c* along each side edge of the blank and top and bottom bending lines **102***a*, **102***b*, **102***c* along a top and a bottom of the blank are shown in the blank **2**. Side edges and top and bottom edges of the blank will be bent along these bending lines for providing bent configurations of the wall module as will be further described below. Corners **4***a*, **4***b*, **4***c*, **4***d* have been cut out from the blank **2** such that both side edges and top and bottom edges of the wall module can be bent. In another embodiment of the invention only the two side edges and a bottom edge will be bent, i.e. not the top edge. In this embodiment only two corners **4***a*, **4***b* need to be cut out.

In the blank **2** according to the embodiment shown in FIG. **2** two recesses **103***a*, **103***b* are shown in a top edge of the blank. Material has been cut out from outer edges of the innermost top bending line **102***a*. These recesses **103***a*, **103***b* can be used for removing a linking element **31** from two connected wall modules.

According to the invention a wall module **1** comprising a substantially rectangular plate **3** is provided. Said plate can be made from a metal such as a sheet metal for example with a thickness from 0.3 to 2.5 mm. Other thicknesses may also be possible. The material of the plate should be possible to bend. Furthermore some degree of resilience in the bending is suitable such that a linking element can be forced into a side opening in a side edge bent configuration of the wall module as will be further described below.

The rectangular plate **3** of the wall module **1** comprises two side edges **5***a*, **5***b*, one top edge **7** and one bottom edge **9**. According to the invention said side edges **5***a*, **5***b* comprise each a side edge bent configuration **11**. FIG. **3***a* is a cross section along the line A:A through the wall module **1** of FIG. **1** showing one of the side edges **5***a* of the wall module **1**. In this view the side edge bent configuration **11** which is present in both side edges **5***a*, **5***b* can be seen. The side edge bent configuration **11** comprises a first side bend **13***a*, a second side bend **13***b* and a third side bend **13***c*, wherein all three side bends **13***a,b,c* are substantially 180° and they are provided along different bending lines **101***a*, **101***b*, **101***c* being parallel with the side edges **5***a*, **5***b* of the plate **3**. A fourth side bend could as well be provided in some embodiments for example for compensating a possible inexactness of a size of the plate **3**. This can be seen in FIG. **3***b*. These side edge bending lines **101***a*, **101***b*, **101***c* can be seen in FIG. **2** where the blank is shown. The bends may not always be exactly 180°. Small deviations from 180° should also be covered by this invention. Even larger deviations from 180° should be covered by the invention, such as 160-200°. A larger bend than 180° of the second side bend **13***b* and a smaller bend than 180° of the third side bend **13***c*

can in some cases be advantageous for improving a locking of a linking element inside the side edge bent configuration which will be further described below. Furthermore the side edge bent configuration **11** comprises a first bent side part **15***a* provided along the side edge **5***a*, **5***b* of the plate **3** between the first side bend **13***a* and the second side bend **13***b*, a second bent side part **15***b* provided along the side edge of the plate between the second side bend **13***b* and the third side bend **13***c* and a third bent side part **15***c* provided along the side edge of the plate between the third side bend **13***c* and an open end side **16** of the plate **3**. If a fourth side bend is provided a fourth bent side part will also be provided and the third bent side part **15***c* will then be provided between the third side bend **13***c* and a fourth side bend. The first, second and third bent side parts **15***a,b,c* are indicated also in the blank in FIG. **2** even though they have not yet been bent in the blank. The open end side **16** is also shown in the blank. The second bent side part **15***b* is overlying said first bent side part **15***a* in the side edge bent configuration **11** and the third bent side part **15***c* is provided in between said first and said second bent side parts **15***a*, **15***b* in the side edge bent configuration **11**. Furthermore the third bent side part **15***c* is smaller than both the first and the second bent side parts **15***a*, **15***b*. Hereby there will be an open space **14** provided inside the third bent side part **15***c* and between the first and second bent side parts **15***a*, **15***b*. In this open space **14** side parts **45***a*, **45***b* of a linking element **31** will be provided when two modules are connected which will be further described below. A radius r**1** of the second side bend **13***b* is provided such that an opening **17** is provided between the first and third bent side parts **15***a*, **15***c* for receiving a linking element **31** into the side edge bent configuration **11**. The radius r**1** of the second side bend **13***b* can be provided such that a width w of the opening **17** between the first and third bent side parts **15***a*, **15***c* is between for example one and two times a thickness of a plate from which the linking element **31** is made. However the width of the opening **17** may be even smaller. If there is some flexibility in the second side bend **13***b* a linking element **31** can be forced into the opening **17** of the side edge bent configuration **11**.

FIG. **3***b* is a cross section of a side edge bent configuration **11'** of a wall module according to another embodiment of the invention. Most of the details are the same as in the embodiment shown in FIG. **3***a* and will not be described again but in this embodiment a fourth side bend **13***d* being substantially 180 degrees is provided. Hereby also a fourth bent side part **15***d* is provided between the third bent side part **15***c'* and the open end side **16'**. Furthermore an optional smaller intermediate bend **13***e* is provided in this embodiment. This intermediate bend **13***e* is for example less than 50 degrees and provided between the third side bend **13***c'* and the fourth side bend **13***d* only for allowing an additional clamping of a linking element.

When two wall modules **1** should be connected a linking element **31** which will be further described below in relation to FIGS. **6***a*-**6***j* is used and a linking element side part is inserted into the opening **17** of the side edge bent configuration. This is described further below.

FIG. **4***a* is a cross section through the wall module along the line B:B in FIG. **1** showing a bottom part of the wall module **1**. In this embodiment of the invention the bottom edge **9** of the plate **3** comprises a bottom edge bent configuration **21** which is similar to the side edge bent configuration **11**. In FIG. **4***b* an alternative bottom edge bent configuration **121** is shown. However in another embodiment of the invention the bottom edge **9** of the plate **3** can be provided without a bent configuration. In the embodiment shown in FIGS. **1** and **2** also the top edge **7** comprises a bent configuration **21'**. However this is mainly because of symmetry reasons. The invention can as well be provided without a bent configuration of the top edge **7**.

The bottom edge bent configuration **21** comprises in this embodiment a first bottom bend **23***a*, a second bottom bend **23***b* and a third bottom bend **23***c*, wherein the first, second and third bottom bends **23***a,b,c* all are substantially 180° and are provided along different bending lines **102***a*, **102***b*, **102***c* being parallel with the bottom edge **9** of the plate **3**. These bending lines **102***a,b,c* are shown in the blank in FIG. **2**. The bends may not be exactly 180° which is covered by the invention. Hereby the bottom edge bent configuration **21** comprises a first bent bottom part **25***a* provided along the bottom edge **9** of the plate **3** between the first bottom bend **23***a* and the second bottom bend **23***b*, a second bent bottom part **25***b* provided along the bottom edge of the plate between the second bottom bend **23***b* and the third bottom bend **23***c* and a third bent bottom part **25***c* provided between the third bottom bend **23***c* and an open bottom end side **26** of the panel. In the embodiment shown in FIGS. **1**,**2** and **4***a* the bottom edge bent configuration **21** is similar to the side edge bent configuration **11** shown in FIG. **3***a* and comprises hereby three bottom bends **23***a,b,c* and three bent bottom parts **25***a,b,c*. The third bent bottom part **25***c* is provided in between said first and said second bent bottom parts **25***a*, **25***b* and the third bent bottom part **25***c* is smaller than both the first and the second bent bottom parts **25***a*, **25***b*. The three bent bottom parts **25***a,b,c* are indicated in the blank of FIG. **2** even though they have not been bent yet in the blank.

FIG. **4***b* shows a bottom edge bent configuration **121** according to another embodiment of the invention where only two bent bottom parts **125***a*, **125***b* and two bottom bends **123***a*, **123***b* are provided. Hereby the second bent bottom part **125***b* is provided between the second bottom bend **123***b* and an open bottom end side **126** of the panel.

The second bent bottom part **25***b*; **125***b* is overlying said first bent bottom part **25***a*; **125***a* in the bottom edge bent configuration **21**; **121** and a radius r**2** of the second bottom bend **23***b*; **123***b* is provided such that an opening **27**; **127** is provided between the first and second bent bottom parts **25***a*, **25***b*; **125***a*, **125***b* (possibly with a third bent bottom part **25***c* in between as in FIG. **4***a*) for receiving a floor strip. In these embodiments of the invention where also the bottom edge **9** of the wall module **1** comprises a bent configuration **21**; **121** as described above the wall module **1** can be mounted to a floor strip, i.e. a strip provided in a perpendicular relationship to a floor. Hereby an easy way of mounting the wall module to a floor is achieved. Furthermore a convenient way of providing a water proof mounting of wall modules can be provided as will be further described below. If three bottom bends **23***a, b, c* are provided and hereby also a third bent bottom part **25***c* as shown in FIG. **4***a* the third bent bottom part **25***c* may help in providing a robust and stable mounting of the wall module **1** to the floor strip. If the floor strip comprises some kind of locking detail at a certain distance from the floor level the wall module can be forced down onto the floor strip until the third bent bottom part **25***c* has passed such a locking detail. If the material of the plate **3** and the bends of the bottom edge bent configuration **21** provide some resilience to the bottom edge bent configuration **21** the third bent bottom part **25***c* will provide a locking feature by locking the wall module **1** in place when the locking detail has been passed. However, in another embodiment of the invention (as shown in FIG. **4***b*) only two bottom bends **123***a, b* are provided and no locking feature needs to be provided. The wall module **1** will then be provided hanging

over the floor strip when mounted. A water proof construction can still be achieved in a convenient way which will be further described below.

In the embodiment of the invention as shown in FIGS. **1** and **4***a* and **4***b* a radius r**3** of the first bottom bend **23***a*; **123***a* is provided such that the first, second and third bent side parts **15***a*, **15***b*, **15***c* of the side edges **5***a*, **5***b* are provided in between a plane in which the first bent bottom part **25***a*; **125***a* is provided and a plane in which a center part of the plate **3** is provided. In other words the side edge bent configuration **11** will be provided closer to the plane of a center part of the plate **3** than the bottom edge bent configuration **21**; **121**. Hereby a linking element which will link two wall modules to each other will always be provided inside a floor strip when the wall modules also are mounted to such a floor strip. If the linking element **31** is provided along the whole length of the wall module and hereby also down to the floor inside the floor strip water cannot pass outside. Hereby a water proof mounting is achieved.

FIG. **5** is a cross section top view of two connected wall modules **1** according to one embodiment of the invention. In this view the side edge bent configuration **11** of the two wall modules **1** can be seen and furthermore a linking element **31** according to the invention. The linking element **31** is inserted into the openings **17** of the side edge bent configurations **11** to link the two wall modules together.

According to one aspect of the invention a wall system is provided, which wall system comprises at least one wall module **1** and at least one linking element **31**; **31'**. According to another aspect of the invention a wall segment is provided comprising at least two wall modules **1** which are linked to each other by a linking element **31**; **31'**.

FIGS. **6***a* and **6***b* show a linking element **31** in a top view and in a perspective view according to one embodiment of the invention. The linking element **31** comprises an elongated rectangular plate **33** having two linking element side edges **35***a*, **35***b*, one linking element top edge **37** and one linking element bottom edge **39**. The linking element **31** comprises further locking features **43***a*, **43***b* which extend from a plane of the elongated rectangular plate **33** of the linking element **31**. The locking features will be locked inside the side edge bent configuration **11** by the third bent side part **15***c* when a wall module and a linking element have been connected. The locking features **43***a*, **43***b* are in this embodiment double folds of the plate **33** along its side edges **35***a*, **35***b*. However other alternatives for locking features are possible and some examples will be described below in relation to FIGS. **6***c*-**6***j*.

Two side parts **45***a*, **45***b* of the linking element **31** comprising double folded plate and a middle part **47** of the linking element **31** comprising a single layer of the plate are hereby provided. A width w**1** of the middle part **47** of the linking element **31** corresponds substantially to a width w**2** of the third bent side part **15***c* of the wall module **1** times two. Hereby, when two wall modules **1** are linked together by a linking element **31** as shown in FIG. **5** the middle part **47** of the linking element **31** will be positioned in the openings **17** of the side edge bent configurations **11** of the two wall modules between the third bent side part **15***c* and the first bent side part **15***a*. The side parts **45***a*, **45***b* of the linking element **31** will be positioned further into the side edge bent configuration **11**, i.e. in the open space **14** as shown in FIGS. **3***a* and **3***b*. Hereby the third bent side part **15***c* will lock the side parts/locking features **45***a*, **45***b*, **43***a*, **43***b* of the linking element **31** inside the side edge bent configuration **11** and a stable connection of the two wall modules **1** is achieved.

A length l**1** of the linking element **31** corresponds substantially to a length l**2** of the wall module **1**. Hereby a stable connection of the two wall modules **1** is achieved and furthermore the linking element **31** will be provided all the way down, passing an upper edge of a floor strip to which the wall modules can be mounted as described above. Hereby a water proof mounting can be assured.

In an alternative embodiment of the invention the linking element can instead be divided into smaller linking parts, i.e. each linking part is not at all as long as the whole wall module as described above. In such embodiment a number of smaller linking parts can be used for linking two wall modules, for example one upper linking element, one lower and one in the middle.

The radius r**1** of the second side bend **13***b* of the wall module **1** is provided such that a side part **45***a*, **45***b* of the linking element **31** can be provided into the opening **17** between the first and third bent side parts **15***a*, **15***c* of the wall module and during the connection will be passing the third bent side part **15***c* which finally will lock a side part **45***a*, **45***b* of the linking element **31** within the side edge bent configuration **11** of the wall module **1** when a wall module **1** and a linking element **31** have been connected. Hereby the side part **45***a*, **45***b* of the linking element **31** will be provided between the first and second bent side parts **15***a*, **15***b* in a space **14** provided inside the third bent side part **15***c*.

FIGS. **6***c* and **6***d* show a linking element **31'** according to another embodiment of the invention. FIG. **6***c* is a top view of the linking element **31'** and FIG. **6***d* is a perspective view of the linking element **31'**. The linking element **31'** according to this embodiment comprises an elongated rectangular plate **33'** having two linking element side edges **35***a'*, **35***b'*, one linking element top edge **37'** and one linking element bottom edge **39'**. The linking element **31'** comprises two side parts **45***a'*, **45***b'* having locking features **201** and a middle part **47'** between said two side parts, whereby a width w**1** of the middle part **47'** corresponds substantially to a width w**2** of the third bent side part **15***c* of the wall module **1** times two. The locking features **201** are in this embodiment of the linking element **31'** provided at a suitable distance from the linking element side edges **35***a'*, **35***b'* and are protrusions **201** formed in the plate for acting as locking parts. A suitable distance is chosen to correspond to the design of the side edge bent configurations **11** of the wall module **1**, i.e. the protrusions **201** should be provided inside the third bent part **15***c* of the side edge bent configuration **11** when the linking element **31'** is connecting two wall modules **1**. Protrusions **201** are hereby formed along the two side edges of the linking element **31'**. The number of protrusions **201** can be varied. For example one protrusion **201** can be provided for each of the two sides of the linking element close to the linking element bottom edge **39'** and one protrusion **201** can be provided for each of the two sides of the linking element close to the linking element top edge **37'**. In another embodiment additional protrusions **201** can be provided with suitable spacing in between these upper and lower protrusions, such as shown in FIG. **6***d*. In another embodiment the locking feature is instead provided as a groove extending from a plane of the plate **33'**. Said groove could be provided along the whole length of the linking element.

FIGS. **6***e* and **6***f* show a linking element **31"** according to another embodiment of the invention. FIG. **6***e* is a top view of the linking element **31"** and FIG. **6***f* is a front view of the linking element **31"**. The design and function correspond to the two previously described linking elements **31**, **31'** in relation to FIGS. **6***a*-**6***d*. Locking features **43***a'*, **43***b'* are in this embodiment provided as one extending groove along

each side of the linking element **31"**. The groove can be formed as a hook for improving a clamping effect inside the bent configuration **11** of the wall modules **1**.

FIGS. **6***g* and **6***h* show a linking element **31'"** according to another embodiment of the invention. FIG. **6***g* is a top view of the linking element **31'"** and FIG. **6***h* is a front view of the linking element **31'"**. The design and function correspond to the previously described linking elements. Locking elements **43***a"*, **43***b"* are in this embodiment provided as a 90 degree bend of the plate along each side of the linking element **31'"**.

FIGS. **6***i* and **6***j* show a linking element **31'""** according to another embodiment of the invention. FIG. **6***i* is a top view of the linking element **31'** and FIG. **6***j* is a front view of the linking element **31"**. The design and function correspond to the previously described linking elements. Locking elements **43***a'"*, **43***b'"* are in this embodiment provided as bends of more than 90 degrees along each side of the linking element **31"**.

FIG. **7** is a top view cross section of two connected wall modules **61** according to one embodiment of the invention. In this embodiment of the invention the wall modules **61** are of sandwich type, i.e. two wall modules **1** of the type described above in relation to FIGS. **1-5** are mounted together possibly with isolation **63** in between. When such a sandwich type wall module **61** should be mounted to another sandwich type wall module **61** either one or two linking elements **31** as described above in relation to FIGS. **6***a*-**6***j* can be used. In FIG. **7** two linking elements **31** are used.

FIG. **8** is a cross section side view of a wall module **1** according to one embodiment of the invention when the wall module **1** is connected to a floor strip **71**. The wall module **1** is the same as shown in the FIGS. **1-5**. The floor strip **71** is a strip connected to a floor **65** normally in a right angle. If the wall module **1** should be part of a wall in for example a bath room where a water proof mounting of the wall is important the floor strip **71** is mounted to the floor in a water proof way or the floor strip may be an integral part of the floor **73**. If the wall module **1** should be a part of a wall in another room where water resistance not is an issue the floor strip can be any kind of rail attached to the floor **73**. In FIG. **8** it can be seen that the wall module **1** is mounted to the floor strip **71** by providing the floor strip into an opening **27** provided between the first bent bottom part **25***a* and the third bent bottom part **25***c* if a third bent bottom part **25***c* is provided. If only a first and a second bent bottom part **125***a*, **125***b* are provided as discussed above in relation to FIG. **4***b* the floor strip **71** is provided into the opening provided between the first and second bend bottom parts **125***a*, **125***b*. Hereby the radius r**2** of the second bottom bend **23***b*; **123***b* should be provided such that the opening **27**; **127** has a width which is about the same as a thickness of the floor strip **71**. Furthermore a locking detail could be provided to the floor strip **71** at a suitable distance above the floor. No locking detail is shown in FIG. **8** but such a locking detail could be suitable for improving stability of the wall module mounting to the floor strip **71**. Such a locking detail could be locked within the bottom bent configuration **21** inside the third bent bottom part **25***c* and could be provided as an inclined edge such that the third bent bottom part **25***c* can slide over it when the wall module **1** is mounted to the floor strip **71**.

FIG. **9** is a cross section side view of a wall module **61** of sandwich type according to one embodiment of the invention when the wall module **61** is connected to a floor strip **71**. The wall module is the same sandwich type as described in relation to FIG. **7**. The mounting to the floor list **71** is the same as described for a single wall module **1** in relation to FIG. **8** and will not be described again.

FIG. **10** shows five wall modules **1**; **61** according to embodiments of the invention connected to each other and to a floor strip **71**. When connecting wall modules according to the invention to each other around a corner as shown in FIG. **10** a corner linking element can be used. Such a corner linking element is shown in FIGS. **11** and **12**. However another possibility is to bend the wall module itself. The middle corner of FIG. **10** is a bent wall module and is shown in further detail in FIG. **13**. The two other corners in FIG. **10** use a corner linking element.

FIG. **11** is a cross section top view of two wall modules **61** of sandwich type as shown in FIG. **7** according to one embodiment of the invention when they are connected to each other by two corner linking elements **81***a*, **81***b* according to one embodiment of the invention. In the same way two single wall modules **1** as the ones described in relation to FIGS. **1-5** can be connected by one corner linking element **81**.

FIGS. **12***a* and **12***b* show schematically a corner linking element **81**; **81***a*, **81***b* according to one embodiment of the invention. The difference between the two different corner linking elements **81***a*, **81***b* as used in FIG. **11** for connecting two sandwich type wall modules is only the length of the legs. Only one example is shown here in FIGS. **12***a* and **12***b* and is numbered as **81** but could as well be **81***a* or **81***b*. The corner linking element **81** comprises an elongated plate **83** having two corner linking element side edges **85***a*, **85***b*, one corner linking element top edge **87** and one corner linking element bottom edge **89**. The corner linking element **81** comprises further a side edge bent **93***a*, **93***b* in each side edge **85***a*, **85***b* hereby providing two side parts **95***a*, **95***b* of the corner linking element **81** comprising double folded plate and a middle part **97** of the corner linking element **81** comprising a single layer of the plate. A length l**3** of said corner linking element **81** corresponds substantially to a length l**2** of the wall module **1** and the radius of the second side bend **13***b* of the wall module is provided such that a side part **95***a*, **95***b* of the corner linking element **81** can be provided into the opening **17** between the first and third bent side parts **15***a*, **15***c* of the wall module. During the connection of the wall module to the corner linking element **81** the side part **95***a*, **95***b* of the corner linking element **81** will be passing the third bent side part **15***c* which finally will lock a side part **95***a*, **95***b* of the corner linking element **81** within the side edge bent configuration **11** of the wall module **1** when a wall module and a corner linking element have been connected. The middle part **97** of the corner linking element **81** comprises a 90° bend **98**.

FIG. **13** shows the middle corner in FIG. **10**. Hereby no corner linking element **81** is used. Instead the wall module **1**; **61** has been bent.

The invention claimed is:

1. A wall system comprising at least one wall module (**1**) and at least one linking element (**31**; **31'**; **31"**; **31'"**; **31""**), wherein

said wall module (**1**) comprises a substantially rectangular plate (**3**), said rectangular plate comprising two side edges (**5***a*, **5***b*), one top edge (**7**) and one bottom edge (**9**), said side edges (**5***a*, **5***b*) each comprising a side edge bent configuration (**11**),

said side edge bent configuration comprises a first side bend (**13***a*), a second side bend (**13***b*) and a third side bend (**13***c*),

all three side bends (**13***a,b,c*) are substantially 180° or 160-200° and are provided along different bending

lines being parallel with the side edges (**5***a*, **5***b*) of the plate, whereby the side edge bent configuration (**11**) comprises a first bent side part (**15***a*) provided along the respective side edge (**5***a*, **5***b*) of the plate (**3**) between the first side bend (**13***a*) and the second side bend (**13***b*), a second bent side part (**15***b*) provided along the side edge of the plate between the second side bend (**13***b*) and the third side bend (**13***c*) and a third bent side part (**15***c*) provided along the side edge of the plate between the third side bend (**13***c*) and an open end side (**16**) or a fourth bent, side part of the plate (**3**),

said first bent side part (**15***a*) will be provided between the plate (**3**) and said second bent side part (**15***b*) and wherein said third bent side part (**15***c*) is provided in between said first and said second bent side parts (**15***a*, **15***b*) and which third bent side part (**15***c*) is smaller than both the first and the second bent side parts (**15***a*, **15***b*),

said linking element comprises an elongated rectangular plate (**33**; **33'**) comprising two side parts (**45***a*, **45***b*: **45***a'*, **45***b'*) along a length of said plate (**33**; **33'**) and a middle part (**47**; **47'**) along the length of said plate between said two side parts,

said two side parts (**45***a*, **45***b*; **45***a'*, **45***b'*) comprises locking features (**43***a*, **43***b*; **201**; **43***a'*, **43***b'*; **43***a''*; **43***b''*; **43***a'''*; **43***b'''*), and the radius of the second side bend (**13***b*) of the wall module is provided such that a side part (**45***a*, **45***b*; **45***a'*, **45***b'*) of the linking element (**31**; **31'**; **31''**; **31'''**; **31''''**) can be provided into an opening (**17**) between the first and third bent side parts (**15***a*, **15***c*) of the wall module and during the connection will be passing the third bent side part (**15***c*) which finally will lock a side part (**45***a*, **45***b*; **45***a'*, **45***b'*) of the linking element (**31**; **31'**; **31''**; **31'''**; **31''''**) within the side edge bent configuration (**11**) of the wall module (**1**) when the wall module and the linking element have been connected,

whereby a width (w**1**) of the middle part (**47**; **47'**) corresponds substantially to a width (w**2**) of the third bent side part (**15***c*) of the wall module (**1**) times two.

2. Wall system according to claim **1**, wherein a radius (r**1**) of the second side bend (**13***b*) is provided such that an opening (**17**) into the side edge bent configuration (**11**) is provided between the first and third bent side parts (**15***a*, **15***c*) for receiving the linking element.

3. Wall system according to claim **2**, wherein

said bottom edge (**9**) of said rectangular plate (**3**) comprises a bottom edge bent configuration (**21**; **121**),

said bottom edge bent configuration comprises a first bottom bend (**23***a*; **123***a*) and a second bottom bend (**23***b*; **123***b*),

the first and second bottom bends (**23***a,b*; **123***a,b*) are substantially 180° and are provided along different bending lines being parallel with the bottom edge (**9**) of the plate, whereby the bottom edge bent configuration (**21**; **121**) comprises a first bent bottom part (**25***a*; **125***a*) provided along the bottom edge (**9**) of the plate (**3**) between the first bottom bend (**23***a*; **123***a*) and the second bottom bend (**23***b*; **123***b*), a second bent bottom part (**25***b*; **125***b*) provided along the bottom edge of the plate between the second bottom bend (**23***b*, **123***b*) and either a third bottom bend (**23***c*) or an open bottom end side (**26**; **126**) of the panel, and

the first bent bottom part (**25***a*; **125***a*) will be provided between the plate (**3**) and the second bent bottom part (**25***b*; **125***b*).

4. Wall system according to claim **3**, wherein a radius (r**2**) of the second bottom bend (**23***b*; **123***b*) is provided such that an opening (**27**) into the bottom edge bent configuration (**21**) is provided between the first and second bent bottom parts (**25***a*, **25***b*; **125***a*, **125***b*) for receiving a floor strip.

5. Wall system according to claim **4**, wherein said bottom edge bent configuration (**21**) comprises also a third bottom bend (**23***c*) being substantially 180° and being provided along a bending line which is parallel with the bottom edge (**9**) of the plate and hereby said bottom edge bent configuration (**21**) further comprises a third bent bottom part (**25***c*) provided along the bottom edge of the plate between the third bottom bend (**23***c*) and an open bottom end side (**26**) of the panel, which third bent bottom part (**25***c*) being provided in between said first and said second bent bottom parts (**25***a*, **25***b*) and which third bent bottom part (**25***c*) is smaller than both the first and the second bent bottom parts (**25***a*, **25***b*).

6. Wall system according to claim **5**, wherein a radius (r**3**) of the first bottom bend (**23***a*; **123***a*) is provided such that the first, second and third bend side parts (**15***a*, **15***b*, **15***c*) of the side edges (**5***a*, **5***b*) are provided in between a plane in which the first bent bottom part (**25***a*; **125***a*) is provided and a plane in which a center part of the plate (**3**) is provided.

7. Wall system according to claim **3**, wherein

said bottom edge bent configuration (**21**) comprises also a third bottom bend (**23***c*) being substantially 180° and being provided along a bending line which is parallel with the bottom edge (**9**) of the plate and hereby said bottom edge bent configuration (**21**) further comprises a third bent bottom part (**25***c*) provided along the bottom edge of the plate between the third bottom bend (**23***c*) and an open bottom end side (**26**) of the panel, which third bent bottom part (**25***c*) being provided in between said first and said second bent bottom parts (**25***a*, **25***b*) and which third bent bottom part (**25***c*) is smaller than both the first and the second bent bottom parts (**25***a*, **25***b*).

8. Wall system according to claim **7**, wherein a radius (r**3**) of the first bottom bend (**23***a*; **123***a*) is provided such that the first, second and third bend side parts (**15***a*, **15***b*, **15***c*) of the side edges (**5***a*, **5***b*) are provided in between a plane in which the first bent bottom part (**25***a*; **125***a*) is provided and a plane in which a center part of the plate (**3**) is provided.

9. Wall system according to claim **1**, wherein the material of the rectangular plate is sheet metal.

10. Wall system according to claim **1**, wherein said locking features (**43***a*, **43***b*; **201**; **43***a'*, **43***b'*; **43***a''*; **43***b''*; **43***a'''*; **43***b'''*) extend from a plane of the elongated rectangular plate (**33**; **33'**) of the linking element (**31**; **31'**; **31''**; **31'''**; **31''''**), which locking features will be locked inside the side edge bent configuration (**11**) by the third bent side part (**15***c*) when the wall module and the linking element have been connected.

11. Wall system according to claim **1**, wherein a length (l**1**) of said linking element (**31**; **31'**; **31''**; **31'''**; **31''''**) corresponds substantially to a length (l**2**) of the wall module (**1**).

12. Wall system according to claim **1**, wherein said locking features (**43***a*, **43***b*) are double folds of the plate (**33**) along its side edges (**35***a*, **35***b*) hereby providing two side parts (**45***a*, **45***b*) of the linking element (**31**) comprising double folded plate and a middle part (**47**) of the linking element (**31**) comprising a single layer of the plate.

13. Wall system according to claim **1**, wherein

the wall system further comprises a corner linking element (**81**), said corner linking element comprising an elongated plate (**83**) having two corner linking element side edges (**85***a*, **85***b*), one corner linking element top edge (**87**) and one corner linking element bottom edge

(**89**), said corner linking element (**81**) further comprising a side edge bent (**93***a*, **93***b*) in each side edge **85***a*, **85***b*) hereby providing two side parts (**95***a*, **95***b*) of the corner linking element (**81**) comprising double folded plate and a middle part (**97**) of the corner linking element (**81**) comprising a single layer of the plate, and a length (l**3**) of said corner linking element (**81**) corresponds substantially to a length (**12**) of the wall module (**1**) and wherein the radius of the second side bend (**13***b*) of the wall module is provided such that a side part (**95***a*, **95***b*) of the corner linking element (**81**) can be provided into the opening between the first and second bent side parts (**15***a*, **15***b*) of the wall module and during the connection will be passing the third bent side part (**15***c*) which finally will lock a side part (**95***a*, **95***b*) of the corner linking element (**81**) within the wall module when a wall module and a corner linking element have been connected, whereby said middle part (**97**) of the corner linking element comprises a substantially 90° bend (**98**).

14. A wall segment comprising a wall system according to claim **1**, comprising at least two said wall modules and said at least one linking element (**31**; **31'**) linking the two wall modules together.

15. A wall system comprising at least one wall module (**1**) and at least one linking element (**31**; **31'**; **31"**; **31'"**; **31""**), wherein

said wall module (**1**) comprises a substantially rectangular plate (**3**), said rectangular plate comprising two side edges (**5***a*, **5***b*), one top edge (**7**) and one bottom edge (**9**), said side edges (**5***a*, **5***b*) each comprising a side edge bent configuration (**11**),

said side edge bent configuration comprises a first side bend (**13***a*), a second side bend (**13***b*) and a third side bend (**13***c*),

all three side bends (**13***a,b,c*) are substantially 180° or 160-200° and are provided along different bending lines being parallel with the side edges (**5***a*, **5***b*) of the plate, whereby the side edge bent configuration (**11**) comprises a first bent side part (**15***a*) provided along the respective side edge (**5***a*, **5***b*) of the plate (**3**) between the first side bend (**13***a*) and the second side bend (**13***b*), a second bent side part (**15***b*) provided along the side edge of the plate between the second side bend (**13***b*) and the third side bend (**13***c*) and a third bent side part (**15***c*) provided along the side edge of the plate between the third side bend (**13**c) and an open end side (**16**) or a fourth bent side part of the plate (**3**),

said first bent side part (**15***a*) will be provided between the plate (**3**) and said second bent side part (**15***b*) and wherein said third bent side part (**15***c*) is provided in between said first and said second bent side parts (**15***a*, **15***b*) and which third bent side part (**15***c*) is smaller than both the first and the second bent side parts (**15***a*, **15***b*),

said linking element comprises an elongated rectangular plate (**33**; **33'**) comprising two side parts (**45***a*, **45***b*: **45***a'*, **45***b'*) along a length of said plate (**33**; **33'**) and a middle part (**47**; **47'**) along the length of said plate between said two side parts,

said two side parts (**45***a*, **45***b*; **45***a'*, **45***b'*) comprises locking features (**43***a*, **43***b*; **201**; **43***a'*, **43***b'*; **43***a"*; **43***b"*; **43***a"*; **43***b"*),

the radius of the second side bend (**13***b*) of the wall module is provided such that a side part (**45***a*, **45***b*; **45***a'*, **45***b'*) of the linking element (**31**; **31'**; **31"**; **31'"**; **31""**) can be provided into an opening (**17**) between the first and third bent side parts (**15***a*, **15***c*) of the wall module and during the connection will be passing the third bent side part (**15***c*) which finally will lock a side part (**45***a*, **45***b*; **45***a'*, **45***b'*) of the linking element (**31**; **31'**; **31"**; **31'"**; **31""**) within the side edge bent configuration (**11**) of the wall module (**1**) when the wall module and the linking element have been connected,

said bottom edge (**9**) of said rectangular plate (**3**) comprises a bottom edge bent configuration (**21**; **121**),

said bottom edge bent configuration comprises a first bottom bend (**23***a*; **123***a*) and a second bottom bend (**23***b*; **123***b*),

the first and second bottom bends (**23***a,b*; **123***a,b*) are substantially 180° and are provided along different bending lines being parallel with the bottom edge (**9**) of the plate, whereby the bottom edge bent configuration (**21**; **121**) comprises a first bent bottom part (**25***a*; **125***a*) provided along the bottom edge (**9**) of the plate (**3**) between the first bottom bend (**23***a*; **123***a*) and the second bottom bend (**23***b*; **123***b*), a second bent bottom part (**25***b*; **125***b*) provided along the bottom edge of the plate between the second bottom bend (**23***b*, **123***b*) and either a third bottom bend (**23***c*) or an open bottom end side (**26**; **126**) of the panel, and

the first bent bottom part (**25***a*; **125***a*) will be provided between the plate (**3**) and the second bent bottom part (**25***b*; **125***b*).

16. Wall system according to claim **15**, wherein a radius (r**2**) of the second bottom bend (**23***b*; **123***b*) is provided such that an opening (**27**) into the bottom edge bent configuration (**21**) is provided between the first and second bent bottom parts (**25***a*, **25***b*; **125***a*, **125***b*) for receiving a floor strip.

17. Wall system according to claim **16**, wherein said bottom edge bent configuration (**21**) comprises also a third bottom bend (**23***c*) being substantially 180° and being provided along a bending line which is parallel with the bottom edge (**9**) of the plate and hereby said bottom edge bent configuration (**21**) further comprises a third bent bottom part (**25***c*) provided along the bottom edge of the plate between the third bottom bend (**23***c*) and an open bottom end side (**26**) of the panel, which third bent bottom part (**25***c*) being provided in between said first and said second bent bottom parts (**25***a*, **25***b*) and which third bent bottom part (**25***c*) is smaller than both the first and the second bent bottom parts (**25***a*, **25***b*).

18. Wall system according to claim **15**, wherein said bottom edge bent configuration (**21**) comprises also a third bottom bend (**23***c*) being substantially 180° and being provided along a bending line which is parallel with the bottom edge (**9**) of the plate and hereby said bottom edge bent configuration (**21**) further comprises a third bent bottom part (**25***c*) provided along the bottom edge of the plate between the third bottom bend (**23***c*) and an open bottom end side (**26**) of the panel, which third bent bottom part (**25***c*) being provided in between said first and said second bent bottom parts (**25***a*, **25***b*) and which third bent bottom part (**25***c*) is smaller than both the first and the second bent bottom parts (**25***a*, **25***b*).

19. Wall system according to claim **15**, wherein a radius (r**3**) of the first bottom bend (**23***a*; **123***a*) is provided such that the first, second and third bend side parts (**15***a*, **15***b*, **15***c*) of the side edges (**5***a*, **5***b*) are provided in between a plane in which the first bent bottom part (**25***a*; **125***a*) is provided and a plane in which a center part of the plate (**3**) is provided.

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